

SEPTEMBER, 1957

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Construction Methods

AND
EQUIPMENT

A MCGRAW-HILL PUBLICATION



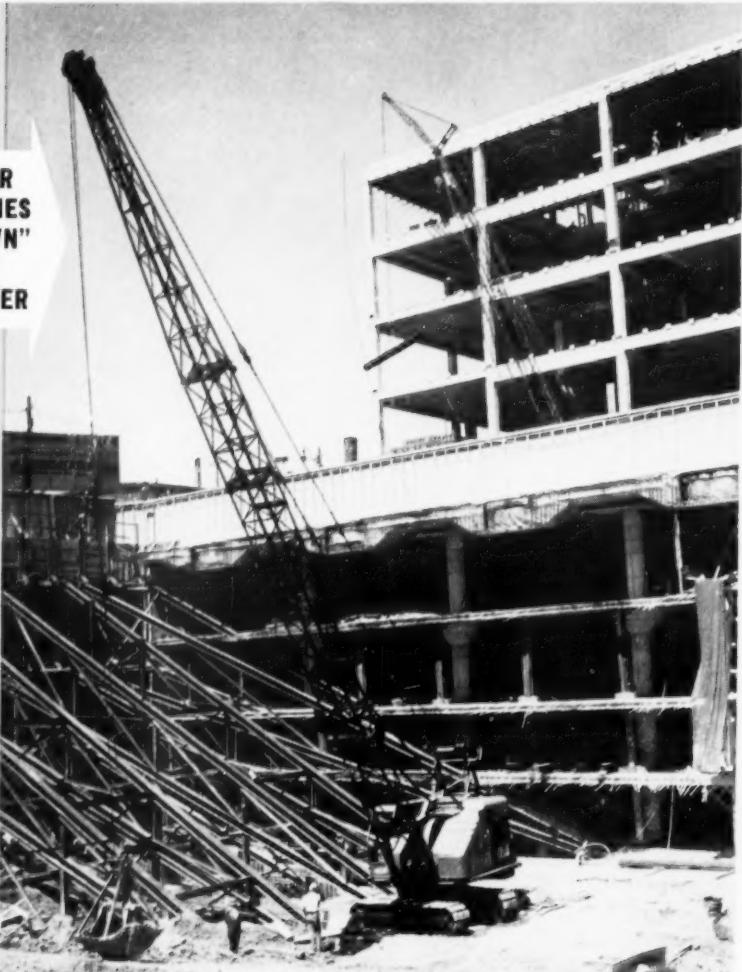
Nimble shovel works 40-ft face to make sidehill cut in rock for road relocation in Oregon . . . page 2

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FOUR
STORIES
"DOWN"
IN
DENVER

It's
dependable,
tough
YELLOW
STRAND

LAYING TILE
IN OHIO



Here's a "face-lifting" job on Denver's Court House Square. Webb & Knapp Construction Co. of Denver is excavating 4 stories below street level for a new hotel structure. The clamshell is equipped with Yellow Strand Wire Rope. In the background, another unit lifts pipe in construction of a new department store. This crane, equipped with an 80-foot boom, also uses Yellow Strand.

Six-ton tile laid in place with dependable Yellow Strand Wire Rope. It's a sewer installation for a new office building in Youngstown, Ohio. J. D. Fowler Co., Youngstown, owners of the crane, specify Yellow Strand because it stands up on tough jobs. Ask your Broderick & Bascom distributor to assist you on wire rope problems. Ask him about long-life Yellow Strand, Flattened Strand and "Powersteel."



Yellow Strand

... always on hand
at your distributor

BRODERICK & BASCOM ROPE CO.

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B.F.Goodrich



These tires handle the biggest jobs... give more traction, more wear, more retreads!

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Equipment rolls on soft ground, over rock-strewn roads, often over no roads at all. Unnecessary tire failures could tie up production—skyrocket costs. But

not for Porath. They use B.F.Goodrich off-the-road tires, report they are "the best tires for this type of work."

One reason is the B.F.Goodrich FLEX-RITE NYLON cord body. It withstands double the impact of ordinary cord materials, resists heat blow-outs and flex breaks. The FLEX-RITE NYLON body outwears even the extra-thick tread, can still be retreaded again and again!

B.F.Goodrich builds off-the-road

tires with extra-thick treads designed to bite into the soil for maximum traction. No matter what kind of construction work you do, there's a B.F.Goodrich tire to make your work go faster, and save you money.

Your B.F.Goodrich dealer has a complete line of tires (left), and he offers expert, on-the-job tire service. See him today or write: B.F.Goodrich Tire Company, A Division of The B.F.Goodrich Company, Akron 18, Ohio.

Specify B.F.Goodrich tires when ordering new equipment

THERE'S A B.F.GOODRICH TIRE FOR EVERY CONSTRUCTION JOB



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SUPER TRACTION

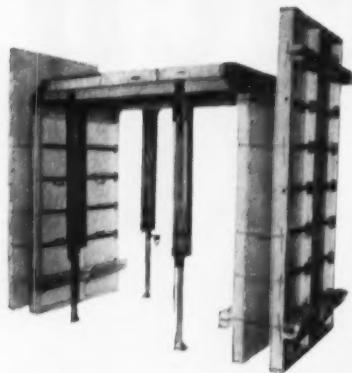
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ROCK SERVICE

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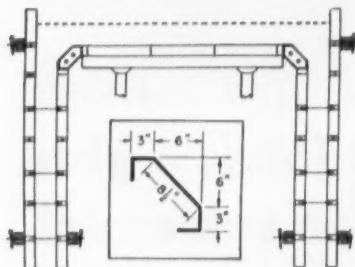
Culvert Forming



Symons Develops New Haunch Form for Culverts

Symons Safety Shores Used to Support Slab

Symons now has a new 9 x 9 inch steel haunch section designed to connect Symons standard wall panels and slab panels for the monolithic pouring of culverts. This new section provides for a 3-inch face on the roof slab and



on the wall with a 45-degree-angle surface $8\frac{1}{2}$ inches wide between wall and roof. No built-up forms or other special equipment is necessary.

Made of 11-gauge hot rolled steel this new section is available in 4, 6, and 8 foot lengths. It can be used with either metal frame or wood frame forms. Symons regular form hardware is used for securing the steel section to Symons standard forms. No special fittings are required.

Symons forms, shores and column clamps may be rented with purchase option. FREE literature on Symons products is available upon request.



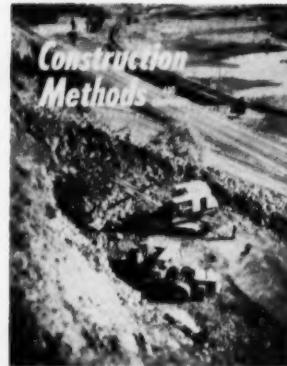
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4255 Diversey Avenue, Dept. J-7
Chicago 39, Illinois

Construction Methods

AND
EQUIPMENT

SEPTEMBER, 1957



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ON THE COVER

Contractor Roy L. Houck & Sons of Salem, Ore., has the job of relocating some 2 mi of U. S. Route 30 around the town of The Dalles on the Columbia River in Oregon. To excavate the approximately 200,000 cu yd of material involved, mostly rock, the contractor brought in a Lorain 85A shovel with $2\frac{1}{2}$ -yd dipper. Working two 8-hr shifts daily, the machine loads into a fleet of four LeTourneau-Westinghouse rear-dump rock wagons that operate on an average $2\frac{1}{2}$ -mi haul. Note that the safety-conscious "Pull" operator stands clear during loading.

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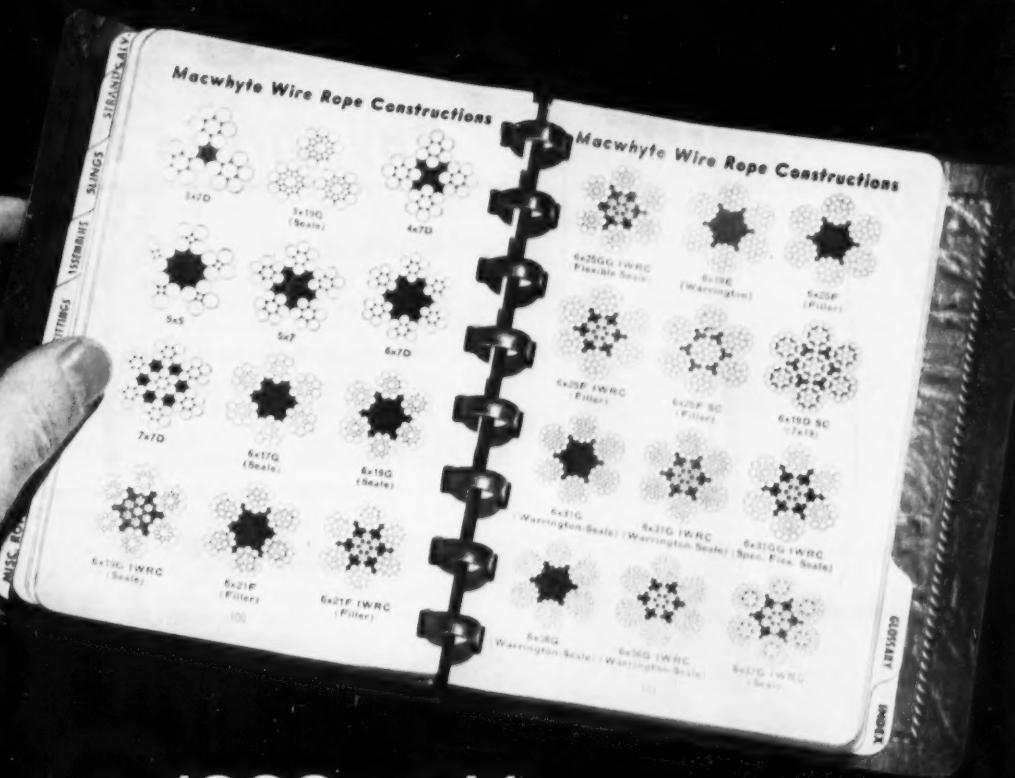
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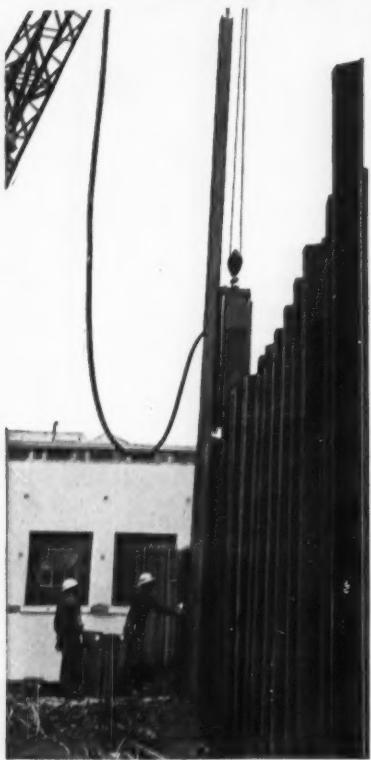
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At 3 P.M....

CAVE-IN!



Cave-ins will happen, through no fault of the contractor. On this excavation job, there was erratic soil behavior, shifting loads, saturating rain . . . everything unpredictable.

When it happened, L. B. Foster Co. was called at 3 P.M. for rental steel-sheet piling *in a rush*. We cut MP-116 piling in our yard, and delivered it in Foster trucks to the job site 400 miles away before the crews started work next morning.

This is typical of the dependable help contractors can expect . . . and get . . . with Foster's Piling Rental Plan. Always the exact length and exact section . . . when you need it . . . on low fixed cost. Call your nearest Foster office for quotations—find out for yourself the real savings in Renting Piling from Foster.

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PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
ATLANTA 8 • HOUSTON 2 • LOS ANGELES 5

September, 1957

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While traffic rolls overhead, unique climbing jacks raise four-lane structure to clear new Seaway canal.	
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Injecting sodium silicate and calcium chloride into sand makes subterranean stone cutoff wall through wet strata.	
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Contractor puts two plants on wheels to follow long, shallow, narrow gravel ridges. Output: 10,000 tons daily.	
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**NEXT
MONTH**

Flexible specs give contractors working on Canadian St. Lawrence Seaway jobs plenty of room for imagination in handling and placing concrete. American engineers and contractors can learn some lessons from next month's story about the methods Canadian contractors have developed.

THESE PORTABLE PUMPS PRIME AT 30 FEET LIFT!



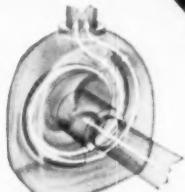
PUMP AT REST

Captured liquid retained for priming. Note absence of the usual check valve.



PRIMING ACTION

Entrained air (B) escapes at (A) to be discharged. Priming liquid returns (C) to entrain more air.



PUMPING ACTION

Straight-in suction voids entrance restrictions. Water enters direct to the eye of the impeller.

THE GORMAN-RUPP COMPANY

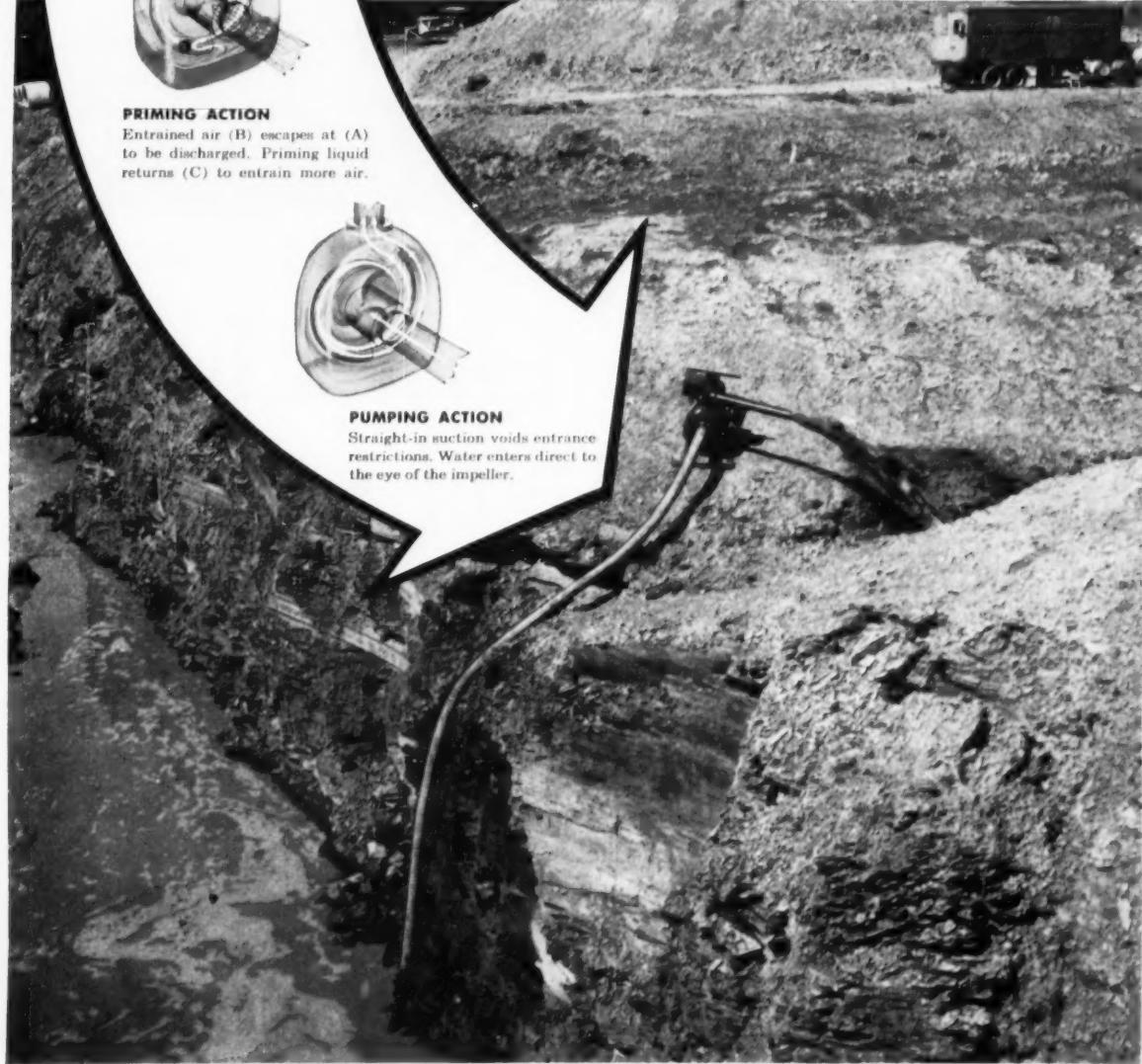
305 Bowman Street • Mansfield, Ohio

Straight-in suction delivers liquid directly to the impeller's eye. Capacity, efficiency and suction lift are increased. No check valve.

Four models:

*Midget, 1½", 6,500 GPH, 2.25 HP;
Pelican, 2", 8,500 GPH, 2.75 HP;
Hawk, 2", 12,000 GPH, 5.5 HP;
Eagle, 3", 18,000 GPH, 6.8 HP.*

You saw them at the Road Show. Buy them now at your Gorman-Rupp Distributor.





Panoramic photo shows over-all magnitude of the Pittsburgh Disposal Plant Project and the tremendous task force of equipment needed to carry it out. Principal lubricants used are Texaco Ursa Oil Heavy Duty for all

"We're out to earn a bonus on a \$100,000,000 project..."

"and that means every piece of construction equipment must deliver its full share without down-time. That's why we set up a special Texaco Lubrication Plan right at the start," says Maintenance Supervisor J. B. Metz of McHugh-Allegheny-Drake Contractors.

Prior planning has paid off for McHugh-Allegheny-Drake. Maintenance Supervisor Metz reports wonderful results:

"The equipment works in damp, steamy excavations, breathes churning dust, pounds its bearings

unmercifully, and still delivers top-rate performance. Down-time is limited to routine maintenance, thanks to the excellent Lube Plan of the Texaco Lubrication Engineer."



TEXACO



engine lubrication; Texaco Marfak Heavy Duty 2 for wheel bearings and general grease lubrication; Texaco Regal Oil R&O for air compressors; and Texaco Meropa Lubricant for transmissions and differentials.

KING-SIZE PUMP WELL . . .

Since last year, the construction equipment of the McHugh-Allegheny-Drake contracting company has been digging what amounts to the biggest ever dug.

The Pumping Station excavation will handle all the sewage to be received in Pittsburgh's new \$17,000,000.00 Sewage Treatment Plant. Two more years will be needed to finish the job.

Even before it began the job, the firm asked to "see a Texaco Lubrication Engineer," who helped draw up a Lubrication Plan covering the entire job. Not only manufacturers' lubrication charts were considered. Weather, terrain, work loads, garaging were all weighed together before the proper Lubrication Plan was chosen. The Plan's lubricants are delivered locally from one of Texaco's 2,000 Distributing Plants.

SHOULD YOU CALL THE TEXACO LUBRICATION ENGINEER?

Before you do, you might want to know what he does:

1. He surveys your equipment and conditions. (Working conditions are important.)
2. He recommends specialized Texaco lubricants to meet the specific requirements of the job. (His choice may differ from yours—*ask him why!*)
3. He arranges local stocks for the items you'll need, to keep your costs low, your service routine.
4. He watches the progress of your Lubrication Plan, and adjusts it to changing conditions.

HOW CAN YOU GET IN TOUCH WITH HIM?

Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States—or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

Lubricants and Fuels FOR ALL CONTRACTORS' EQUIPMENT



Turnpike Interchange

The Mahoning Valley Interchange of the Northeastern Extension of Pennsylvania Turnpike links the turnpike with U. S. Route 209. It is one of the major construction jobs along the four-lane superhighway which connects the port and industrial facilities of Philadelphia with the anthracite coal regions and Pocono Mountain resort sections of the North.

Bethlehem, which is well represented on all sections of the Pennsylvania Turnpike, supplied dowel units,

reinforcing steel, bar mats and other highway steels for the road bed. In addition, Bethlehem structural shapes were used in the construction of bridges and overpasses, and Bethlehem guard rail protects motorists and truckers along many miles of the highway.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation, Export Distributor; Bethlehem Steel Export Corporation

BETHLEHEM STEEL



41TC

35 Ton Capacity



YOUR CHOICE ON RUBBER!

25TC

25 Ton Capacity



ALL truck cranes are not alike! Don't buy a truck crane without comparing the advantages Northwest brings you.

Look at the booms—the greater strength is obvious. Pivoted gantries are easily raised and lowered for clearance. Removable counterweight makes the reduction of gross weight a matter of minutes. Independent High Speed Boom Hoists are power controlled in both directions and operate independently of any other machine function and without sacrificing either of the main hoist drums.

Sectional boom hoist rigging and pendant lines make possible quick adjustment to boom length changes. Telescopic boom struts are standard. Extended boom point sheave shaft for pile driver leads, adjustable jibs, 3rd drums, all can be had to meet your requirements.

Lastly, remember Northwest carriers are not to be confused with carriers supplied for any other crane. They are Northwest designed—built to Northwest specifications with advantages found in no other crane carrier.

A Northwest man will be glad to give you full details—remember two sizes to select from—25-ton and 35-ton capacity. Get the whole story before you buy.

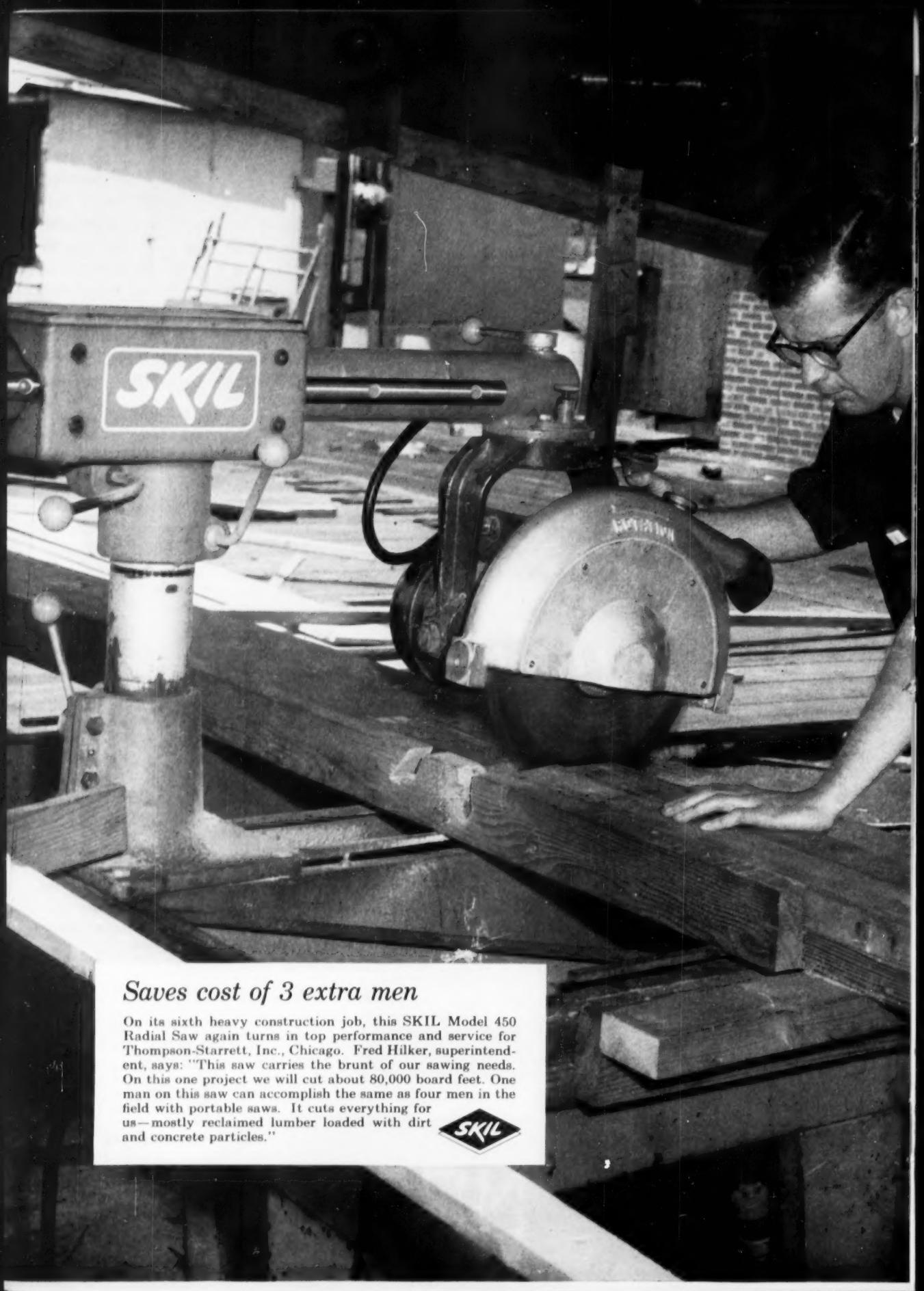
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EVER BUILT INTO
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DRAGLINE OR
PULLSHOVEL

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Saves cost of 3 extra men

On its sixth heavy construction job, this SKIL Model 450 Radial Saw again turns in top performance and service for Thompson-Starrett, Inc., Chicago. Fred Hilker, superintendent, says: "This saw carries the brunt of our sawing needs. On this one project we will cut about 80,000 board feet. One man on this saw can accomplish the same as four men in the field with portable saws. It cuts everything for us—mostly reclaimed lumber loaded with dirt and concrete particles."



On heavy construction you SAVE with SKIL Tools

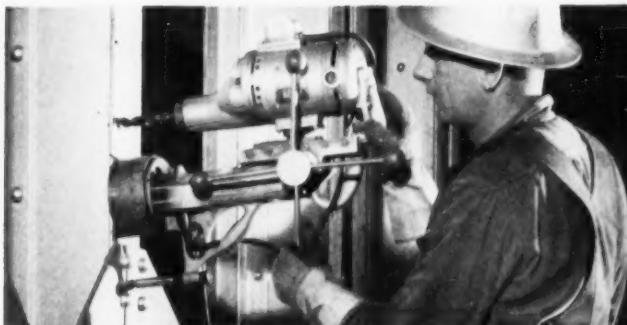


Saves 50% cutting cost per job

Mr. Bert Archibald, superintendent of Priester Construction Co., Davenport, Iowa, feels this way about SKIL Saws: "It's the first tool on the job and the last off—and the most important while we're working. You don't need to baby this Model 77 Saw no matter what the stock is—transite, sheet metal, conduit or stone. We figure we easily save 50% of our cutting costs. No maintenance or downtime plus faster cutting, easier handling."



Made only by SKIL Corporation, manufacturer of famous SKIL and SKILSAW products, Chicago 30, Illinois. Factory branches in all leading cities.



Cuts drilling time 400%

The SKIL Model 163 Drill used in combination with a stand has replaced all other methods used by McGraw Construction Co., Middletown, Ohio. Mr. R. H. Newman, superintendent, says: "We can depend on the SKIL Model 163 Drill and Stand to complete a heavy drilling job in 2½ minutes. Average time with another unit would take ten minutes longer." This combination eliminates many smaller operations such as welding, cutting away or clamping.



Save with new SKIL 7 1/4" Saw

New top-handle design in a super-duty saw. More power and speed—plus convenient, easy handling. All new model with many money-saving exclusive features. No matter what you have to saw, sand, grind or drill, there's a SKIL tool to do the job better, faster, cheaper. Ask your SKIL distributor to show you why. And ask for a free on-the-job demonstration of new Model 857 7 1/4" saw.

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Please send FREE catalog on power tools.
Please send me name of nearest distributor.

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Title _____

Company _____

Address _____

City _____

State _____



6.7-cu.-yd. heaped capacity

Full hydraulic operation

Powered by famous GM 83 h.p. diesel



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cuts costs on any size dirt job

Priced thousands below others

You'll make no mistake with this new Oliver 990! With its small 6.7-cu.-yd. capacity you're set to work *everywhere* at low cost. And you'll be amazed with its ability.

Here's every operating advantage you want—fast cycle, full-biting scraper action, positive forward ejection, high clearance, 100% hydraulic operation. It's a ripsnorting, hard-working rig without expensive frills to run up your costs. The easiest self-loader on the market to buy.

New economy for small jobs

Now you can use the efficient scraper method on dozens of small jobs...outproduce other types of equipment on all kinds of grading, filling and spreading assignments...and move quickly from job to job with its perfect road size. No permits needed.

A fill-in rig for big projects

You'll handle cleanup work on

mass-fill jobs more easily, too. No need to divert larger machines. The 990 gets in more handily with its smaller size, maneuvers fast, makes complete nonstop 180° turn in only 33½'.

Bulletin I-703 has detailed specifications. Write for your copy today.

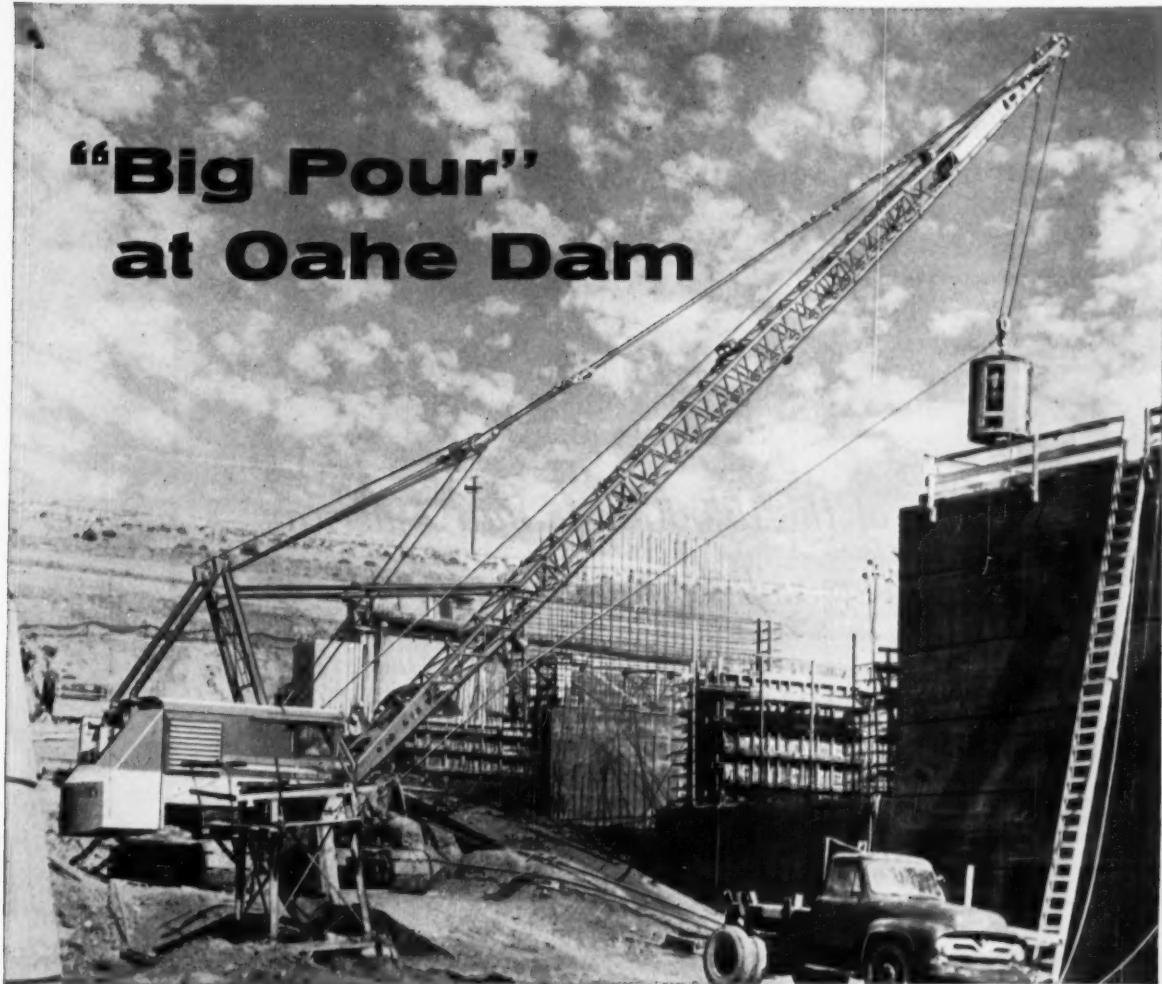


THE OLIVER CORPORATION

400 West Madison Street, Chicago 6, Illinois

a complete line of industrial wheel and crawler tractors and matched allied equipment

"Big Pour" at Oahe Dam



Manitowoc crane handles almost 115,000 yards of concrete

Pierre Constructors rely on a fast Manitowoc Model 3900 60-ton crane to set the pace spot pouring concrete at the \$320,000,000 Oahe Dam Project near Pierre, South Dakota. The company's concrete contract calls for 115,000 yards—most of it handled by the Manitowoc rig equipped with a 100' boom and a 2-yd. bucket.

Precise Control

Easy-to-operate air controls and smooth torque converter power help the crane operator to hit the forms with absolute precision. The 11,600 lb. bucket is brought to within 6" of the forms easily and quickly because of the exact "feel" of the air controls. Uniform power flow from the torque converter eliminates all "jump" from crane operation when swinging the heavy concrete bucket over the forms.

Also Sets Stone

In addition to pouring concrete, the Manitowoc 3900 also sets derrick stone. For this exacting operation, the same 100' boom is used, providing a 45-ton capacity.

The crane's wide-spread crawlers and massive carbody, together with balanced design for scientific weight distribution, assure the positive stability necessary for pin-point accuracy.

Performance-Proved

Pierre Constructors also operate a Manitowoc 1½-yd. Model 2000 Trench Hoe at the dam site. H. B. Bruce, Project Manager for the company says, "Both units have come up to all expectations. We especially like the independent boom hoist on the crane which allows us to lift and at the same time operate in a larger area without shifting the boom or traveling. This not only saves time, but also cuts down on wear and tear on the machine."

You can have outstanding performance like this on your next contract. Call your Manitowoc distributor now for full details and informative literature.

Manitowoc Engineering Corp., Manitowoc, Wis.

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1-5½ YD.**
Manitowoc
**CRANES
20-100 TON**



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CONVEYORS...LOADERS...DITCHERS...ASPHALT PAVING EQUIPMENT

Construction News

From Washington

**Washington, D.C.
September, 1957**

Economy Drive Hits Construction

Congressional appropriations and authorizations for federal public works during the next 10 months reflect the budget-cutting mood on Capitol Hill—particularly in the money voted for military projects. Here's the scoreboard:

Construction money actually voted for water resources totals \$636 million, 3% less than the President asked and \$11 million less than voted last year.

Over-all total for civil works of the Army Engineers and the Reclamation Bureau is \$816 million, down \$15 million from the budget request and \$29 million below last year's appropriations.

More than \$700 million goes to the Corps of Engineers to start 30 new projects. The top 10 jobs on this list are: a \$350-million John Day lock and dam on the Columbia River (not yet authorized by Congress), a \$101-million Allegheny River dam and reservoir (Pa. and N.Y.), a \$92-million Mississippi River outlet from New Orleans to the Gulf, a \$73-million New Richmond lock and dam on the Ohio River, a \$73-million Strawn-flood-control dam in Kansas, a \$34-million Carlyle dam and reservoir in Illinois, another \$34-million Hopkinton-Everett flood-control dam in New Hampshire, an \$18-million Hogan dam and reservoir in California, a \$12.5-million Cooper reservoir and channel in Texas, and a \$12-million North Hartland flood-control dam in Vermont.

Three new reclamation starts also get initial funds totaling \$9 million in this appropriation: a \$6.3-million Crooked River project and another \$510,000 Wapinitia project, both in Oregon, and a \$212-million Little Wood River project in Idaho.

Wiped out by the economy wave were two bigger reclamation jobs in the Missouri River Basin—a \$32-million unit at Farwell, Neb., and a \$26-million one at Ainsworth, Neb. A request for money to start a \$47-million extension of the Shoshone unit in Wyoming was withdrawn because the project wasn't ready to go.

Congress also turned down pleas from the upper Colorado River states for money to start additional irrigation units of the billion-dollar upper basin project. However, the Administration's request for a \$25-million authorization for this project was passed, assuring bid invitations this year for two big jobs—the \$83-million Flaming Gorge Dam on the Green River in Utah, and the \$37-million Navajo Dam in northwestern New Mexico.

Military Construction Slashed

New construction money for the armed forces took a bigger beating. It totals \$1.5 billion of the \$2.2 billion in new money the President originally asked and subsequently pared down to \$1.65 billion.

continued on next page

Construction News from Washington . . . continued

The new money will pay for \$1.2 billion of new military projects authorized in a separate bill. New authorized projects were actually cut as much as the hold-down on previously okayed projects—down \$900 million from the \$2.1 billion programmed in January and \$350 million less than the Pentagon asked in May.

These cuts forecast a decline in construction spending in future years to an annual rate of perhaps \$1.5 billion. The tapering off will begin in the next 12 months. The Defense Department has ordered a hold-down of 10% under last year's \$2 billion rate.

Highway Contracts

Highway contractors will get at least \$30 billion of jobs on the Interstate System, instead of the \$22 billion previously estimated for the 15-year program. The new volume estimates will firm up next January when the Bureau of Public Roads reports revised cost figures to Congress. State highway department estimates of the cost of building the interstate system are up from \$27 to \$40 billion, and contract construction will account for most of the increase.

Already, roadbuilding on the system has topped \$882 million in contracts advertised or awarded for 2,000 miles of highways. Texas has set the pace with 25 miles finished and 290 miles under construction. In addition, states have programmed over 1,200 miles of roads costing more than \$773 million of which the federal government will pay about \$550 million.

More than 2,000 miles of major toll roads will be included in the Interstate System, according to federal highway boss Tallamy. Next January Congress will decide whether the federal government will take over these roads and make them free.

Atomic Power Plants Authorized

Congress rushed in its closing days to approve \$135 million of atomic power plant construction money. This included \$26 million for federal reactor building programs, including plans for Atomic Energy Commission construction or development of six power reactors, four of them for public power groups.

Adjournment Rush Shelves Bills

In its usual rush to get back home, Congress left as unfinished business two bills affecting the construction industry—bid-shopping and lease-purchase.

The bid-shopping bill, requiring general contractors on federal jobs to get tentative lists of subcontractors okayed in Washington, will come up again next session when a compromise version stands a good chance of passage.

But the bill on lease-purchase, the government's stalled program of leasing federal buildings on long-term contract and later taking them over instead of buying them new is dead. Congressional authorization for the program ran out this year.



**M-S-A® Winter Liners provide
the warmest comfort a head ever had
for working those cold outside jobs
in raw wintry weather**

ZIPPER-TYPE. Zip-on, zip-off earflaps. Lined, water-repellent grey-fall cloth. For laced or snap-in suspensions.

TAB-TYPE. Four snap-tabs for quick, easy fastening and unfastening. Same protective material as Zipper-Type.

SHOCKGARD LINER. Head, ear and neck protection. Liner can be tied to crown straps when worn next to head.

SHOCKGARD LINER. Outer material coated with special flexible neoprene. Ideal for use in extremely heavy winds.

SHOCKGARD LINER. Durable greyfall cloth, suede-lined, keeps out weather. No metal parts on Shockgard liners.

KNITTED-TYPE. Snug-fitting, warm wool cap provides workers with lightweight head and ear comfort.

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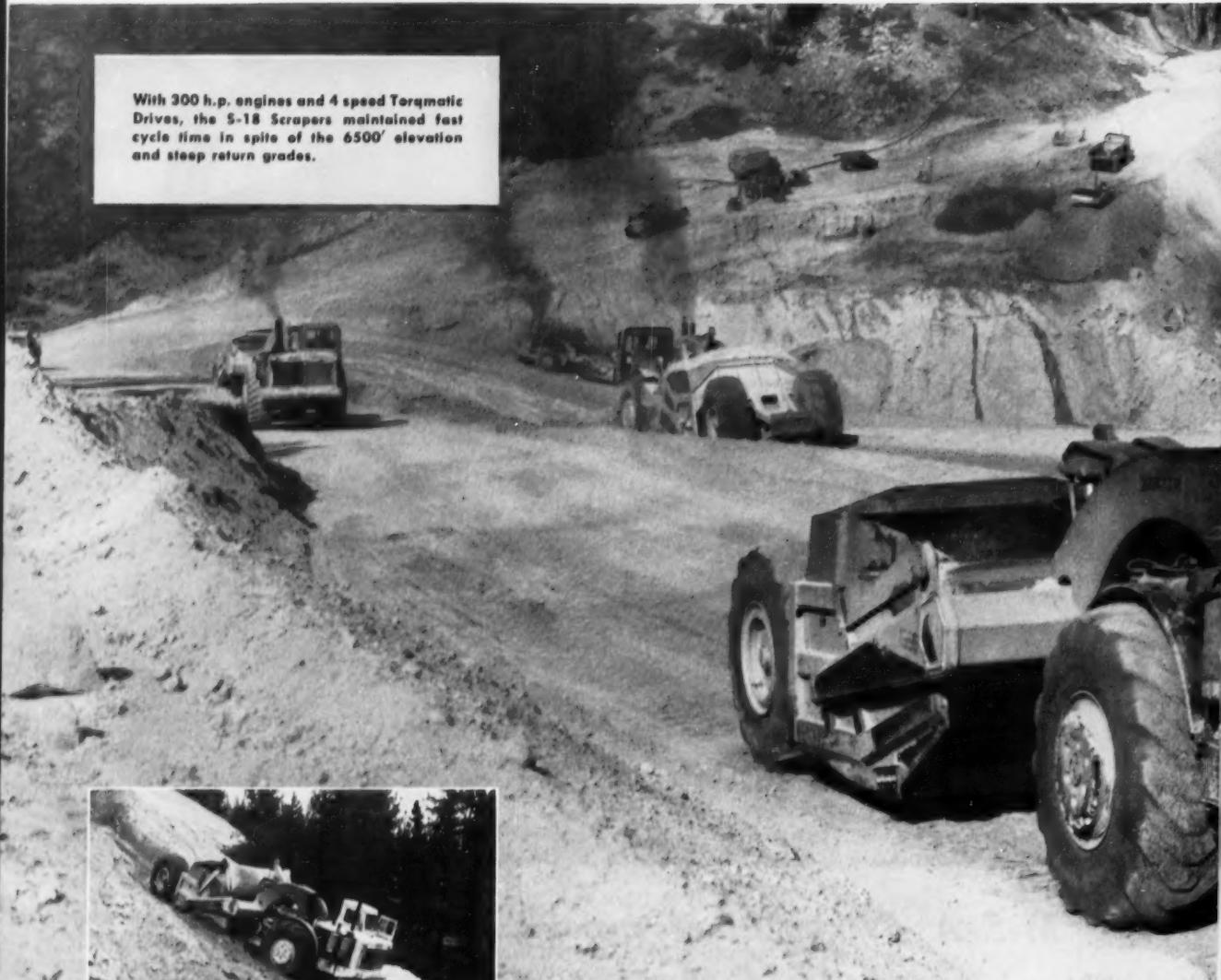


Call the MSA man on your every safety problem
... his job is to help you



OVER 12,000 YDS. A DAY WITH

With 300 h.p. engines and 4 speed Torqmatic Drives, the S-18 Scrapers maintained fast cycle time in spite of the 6500' elevation and steep return grades.



On one side-hill cut the S-18 "Eucs" loaded at the top of the cut and hauled to the toe of the fill—510' difference in elevation!



Loaded by a 4½ yd. shovel, the 22-ton Rear-Dump "Eucs" move heavy excavation from a cut where the granite had to be drilled and shot.

Good stability resulting from the low, wide bowl design, easy hydraulic operation, and plenty of power and traction enabled the "Eucs" to get heaped loads averaging 15 bank yds. of decomposed granite in a hurry.



"Euc" Scrapers are your best investment — have your Euclid dealer show you why!

8" Euc "S-18 SCRAPERS

on a job so tough that
"scrapers couldn't be used!"

Isbell Construction Co. knows what a tremendous difference high production Euclid equipment makes on their earthmoving jobs. Thirty years ago this contractor used a spread of mule-drawn $\frac{1}{2}$ yd. Fresno scrapers in building a road (now U. S. Route 50) through rugged mountain country between Carson City, Nevada and Lake Tahoe.

Today on a nine-mile section of this same road, at about 6500' elevation, Isbell is relocating the road to eliminate hairpin curves and steep grades. Other contractors who bid the job didn't think scrapers could be used—figured their estimates on the basis of using shovels and trucks to move the more than $3\frac{1}{3}$ million yards of excavation. But Isbell had experience with Model S-18 "Eucs" equipped with Torque Converters and knew what these 18 yd. scrapers could do on tough work.

In spite of having to work in close quarters on the mountain side, and climbing return grades as much as 27%, scrapers have moved about 80% of the yardage in cuts up to 230' and fills to 160'. Eight of the S-18's are working 20 hours a day and on a section with a 400' one-way haul and return with a 20% adverse grade they complete a cycle in 7 minutes. A fleet of 10 Rear-Dump "Eucs" of 22-ton capacity and three 15-ton models are used where the heavy granite must be shot and shovel loaded.

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio



Fills on the 9 mile project average 50' to 100' in height, with the highest being 190'—they make it possible to keep grades on the new 4-lane road to an average of 5%.

Up and down they go—the S-18 "Eucs" carry their heaped loads of 15 bank yds. or more down 400 feet of 20% grade, dump on the fill, and climb back for another load—each scraper makes 7 to 8 trips per hour.



Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE



POWER STEERING That Can Take It

For TRUCKS That Can Take It

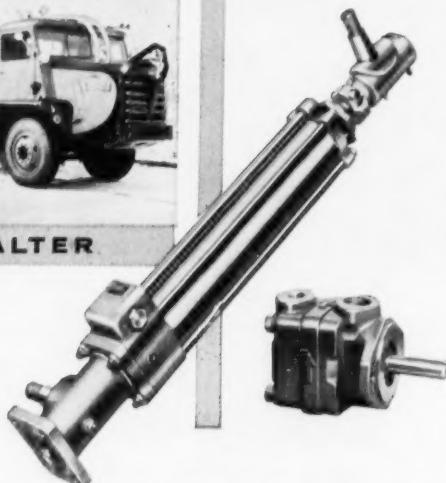


VICKERS® HYDRAULIC POWER STEERING

The hydraulic power steering systems used on trucks like these have to be able to take it because the vehicles are required to take it. They are built for the rough, tough jobs . . . and the hydraulics must match. Heaviest axle loads . . . off road operation . . . the most difficult steering conditions possible are easily mastered by the power, inherent high quality, dependability and tough durability of Vickers Hydraulic Power Steering Systems.

Steering is made "fingertouch" easy and safe. Road reaction can't reach the driver through the steering wheel. Obstructions can't cause swerving. Driving is not a wrestling match, so the driver gets more work done with less fatigue.

VICKERS INCORPORATED
DIVISION OF SPERRY RAND CORPORATION
Mobile Hydraulics Division
ADMINISTRATIVE and ENGINEERING CENTER
Department 1494 • Detroit 32, Michigan



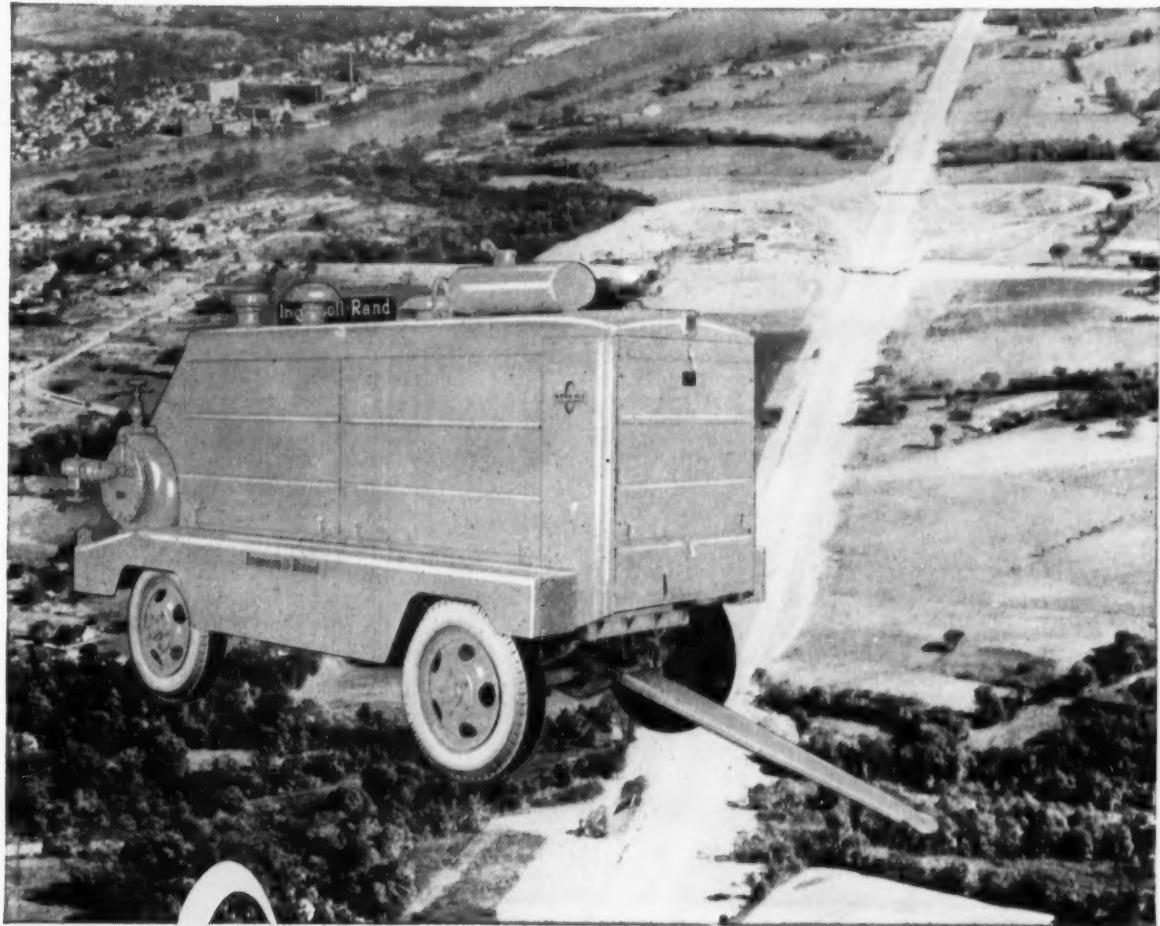
The superior design and rugged construction of the Vickers Hydraulic Power Steering Booster assure dependability, long life and low maintenance. Typical are the oversize piston rod and the extra large control valve.

The Vickers Vane Type Pump has hydraulic balance that eliminates pressure-induced bearing loads and assures long life with minimum maintenance . . . the key to less downtime. Correct running clearances (both radial and axial) are automatically maintained, providing high efficiency throughout pump life.

Get all the facts about the advantages of Vickers Hydraulic Power Steering. Ask for Bulletin M5101A.

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ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921



GYRO-FLO *the greatest of them all...*

PORTABLE ROTARY
COMPRESSORS

Ever since 1902, Ingersoll-Rand has pioneered the outstanding developments in portable air compressors. Time after time these proved to be major steps in setting new standards of comparison. Each new model was acclaimed "the best ever" by users all over the world.

In 1950, when I-R introduced the Gyro-Flo — the first successful portable rotary compressor — it was the subject of much speculation and comment. Some thought that it would not stand up, others felt that this was the compressor they had dreamed of.

Today, although the Gyro-Flo is perhaps the most widely imitated compressor in history, it stands in a class by itself — unequaled in time-proven performance, dependability and low-cost maintenance.

The Gyro-Flo is available in six sizes — 85, 125, 210, 315, 600 and 900 cfm — the most complete line of portable rotary compressors in the world. And, certainly Gyro-Flo is the "greatest of them all."

Write for Form 2321-B.



2-640

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THE BEST AIR EQUIPMENT FOR BETTER HIGHWAYS

ENGINEER'S FIELD REPORT

PRODUCT RPM DELO OIL
EDWARD KEEBLE CONSTRUCTION CO.
FIRM San Jose, California

RPM DELO Oil keeps tractor on the job 15 years



Still Working after 15 years using RPM DELO Oil in this D-8 Caterpillar operated by Edward Keeble Construction Co. Block, crankshaft, and most other parts of original engine are still in use. Another of firm's D-8's using RPM DELO Oil ran 12,000 hours without engine repairs. When torn down, maximum crankshaft wear was .004".



Crawler Crane. like firm's other heavy-duty equipment, uses RPM DELO Oil. Keeble operates 120 pieces of construction equipment—has as many as 30 jobs going at once.



GMC V-8 10-Yard Dump Truck (left), one of a new fleet of 12, also uses RPM DELO Oil. Mr. Keeble (right), says, "For the past 15 years we have kept our heavy-duty engines in top operating condition with RPM DELO Oil. In several instances engines have actually outlasted equipment."



TRADEMARK "RPM DELO" AND
DESIGN REG. U. S. PAT. OFF.

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20
THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey

Why RPM DELO Oils reduce wear—prolong engine life

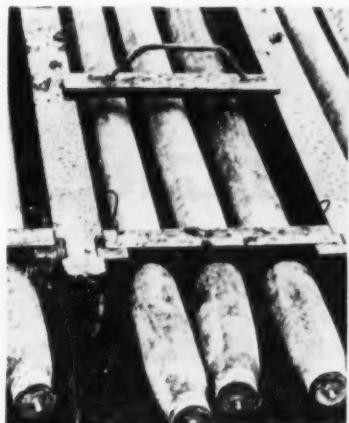
- Oil stays on engine parts — hot or cold, running or idle
- Anti-oxidant resists lacquer formation
- Detergent keeps parts clean
- Special compounds prevent corrosion of bearing metals
- Inhibitor resists crankcase foaming



For More Information or field help with any fuel or lubrication problem, contact representative of any company listed, or write direct.

STANDARD OIL COMPANY OF TEXAS, El Paso
THE CALIFORNIA COMPANY, Denver 1, Colorado

Job Talk . . .



INFLATED rubber tubes are held in form by steel bridges. Note air valves at ends.



COMPLETED precast piles 70 ft long have hollow core made with inflated tubing.

Inflatable Rubber Tubes Form Ducts in Concrete

European contractors are making extensive use of inflatable rubber tubing to form ducts in precast and prestressed concrete members. Tubes are easy to install, produce smooth surfaces, and can be re-used many times.

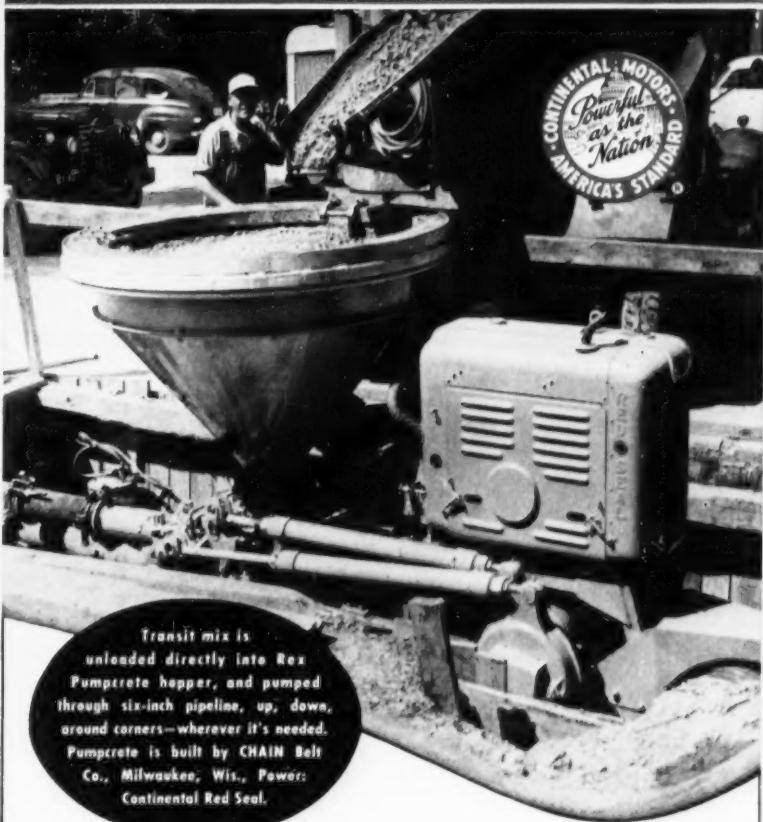
Reinforced with cotton braid woven on a diagonal mesh, the tubes expand and contract as desired. Standard length of tubes is 60 ft, and the range of diameters available is $\frac{3}{4}$ in. to 12 in. Several lengths may be joined to form a tube up to 330 ft. long, but excessive withdrawal friction develops on longer lengths. However, two 330-ft tubes can be butted together and withdrawn in opposite directions.

Tubes can form either straight or curved ducts. They are in-
continued on page 28

Pumpcrete Speeds the Job

with

DEPENDABLE RED SEAL POWER



Transit mix is unloaded directly into Rex Pumpcrete hopper, and pumped through six-inch pipeline, up, down, around corners—wherever it's needed. Pumpcrete is built by CHAIN Belt Co., Milwaukee, Wis., Power: Continental Red Seal.

Convenience, speed and low cost are some of the advantages of the Pumpcrete concrete placement system over conventional scaffold-and-buggy methods. Costly and time-taking preparatory steps—erection of scaffold, elevators, runways, trestles and towers—are eliminated. The Pumpcrete unit can be located without reference to the final destination of the mix, because quick-change couplings permit lengthening and turning of the line to deliver exactly where needed . . . and when the job is finished, there's no dismantling to be done. Concrete delivery by Pumpcrete is one of many construction operations performed most dependably, at lowest cost, by Continental Red Seal Power.

WORLD'S LEADING INDEPENDENT MANUFACTURER OF INTERNAL COMBUSTION ENGINES, CONTINENTAL MOTORS OPERATES PLANTS IN ATLANTA, DALLAS, DETROIT, MILWAUKEE, MUSKEGON, AND TOLEDO, AND IN ST. THOMAS, ONT., PRODUCING AIR-COOLED AND LIQUID-COOLED ENGINES FOR USE ON LAND, AT SEA AND IN THE AIR.

Continental Motors Corporation

MUSKEGON • MICHIGAN

MODEL 154



**2 cu. yd. cap., 4-wheel drive
with Torqmatic transmission.**

MODEL 104



**1 1/2 cu. yd. cap., 4-wheel drive
with Torqmatic transmission.**

MODEL LHM 75



**1 1/4 cu. yd. cap., 2-wheel drive
with torque converter.**

NOW...

YALE FOR TROJAN

For almost 90 years the famous YALE trademark has appeared only on products of the highest quality. Today, the YALE trademark appears on the TROJAN line of tractor shovels—machines that have pioneered the development of many construction and operating features that have helped set a new trend in bulk material handling techniques.

In the new line of TROJAN tractor shovels you'll find machines that will deliver extra digging power and faster loading ability—permit safe, fatigue-free handling because the operator is completely protected—operate efficiently and economically because every single feature is engineered to produce faster, smoother loading cycles.

This complete combination of desired features will demonstrate to contractors and public officials that only the best is good enough to carry the YALE trademark.



STRAIGHT LINE HORIZONTAL THRUST



INDEPENDENT BUCKET ACTION



LOW LOAD CARRYING POSITION

LOOK TO & TOWNE TRACTOR SHOVELS



TROJAN^{*} TRACTOR SHOVELS

YALE & TOWNE

2 & 4 Wheel Drive Front-End Loaders

CONTRACTORS MACHINERY DIV., THE YALE & TOWNE MANUFACTURING COMPANY, BATAVIA, NEW YORK; SAN LEANDRO, CALIFORNIA

...Announcing new profit



- 1 Compare lifting capacities with boom at extended radii . . .
- 2 not at minimum radius where little work is actually done

LINK-BELT SPEEDER ZEPHYRCRANES feature greater capacities with long booms at extended radii



Truck-crane production is directly related to lifting capacity. But lifting capacity varies with boom length and radius.

Thus, it's important to measure capacity with the boom out 25 to 40 feet or more where most work is done. And on this basis, you'll be amazed to discover by how big a margin a Link-Belt Speeder outperforms other rigs.

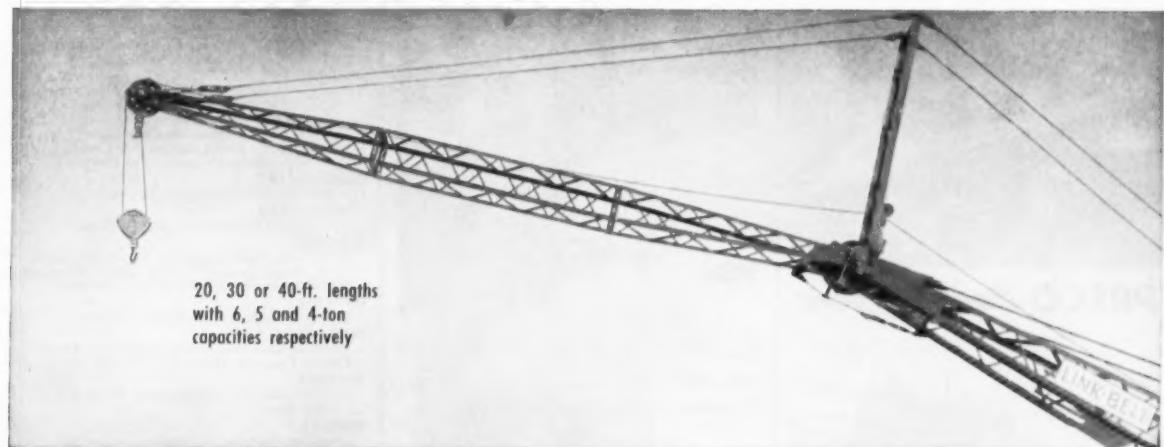
Why? Each Link-Belt Speeder Zephyrcrane (six models, 10 to 35-ton capacities) is years ahead in design. It's a machine with extra "live" weight, a machine with a strategically-located upper for better balance and stability. It has a new high strength alloy boom, new

high-capacity jib and scores of features such as the patented high retractable gantry.

What's more, every Link-Belt Speeder has Speed-o-Matic—the exclusive true power hydraulic control system. Fingertip-operated, Speed-o-Matic provides fast, positive, precise response . . . perfect feel of the load at all times.

But that's only part of the story. For complete details on how a Link-Belt Speeder can help you profit more, set new high standards of truck-crane performance and production—contact your Link-Belt Speeder distributor or write—Link-Belt Speeder Corporation, Cedar Rapids, Iowa.

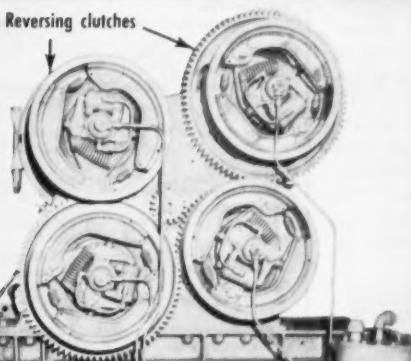
standard for truck-cranes



NEW HIGH CAPACITY JIBS are all-welded, box latticed and built from lightweight but exceptionally strong alloy steels. Available for Link-Belt Speeder HC-88, HC-98 and HC-108 truck-crane models (25, 30 and 35-ton capacities)—the jibs are designed and furnished with jib

backstop cables. Turnbuckles are provided for length adjustments to meet a wide variation of jib to boom angles. The jib peak sheave and the jib strut deflector sheaves are mounted on anti-friction bearings. A ten foot jib strut is furnished for all jibs regardless of length.

Reversing clutches



LOAD LOWERING CLUTCHES

Speed-o-Matic hydraulic-actuated reversing clutches are available for either or both main drums. They provide power load lowering of main hoist line and jib whip line. Also, these clutches are self-compensating for heat and normal lining wear . . . seldom require downtime for hairline adjustment.

POWER-CONTROLLED BOOMHOIST

Another important Link-Belt Speeder feature is Independent Rapid Boomhoist which provides power raising and power-controlled lowering of the boom through large, two shoe boomhoist and boom lowering clutches. Clutches are same size and interchangeable with the main hoist and swing clutches.



NEW 4-AXLE CARRIER

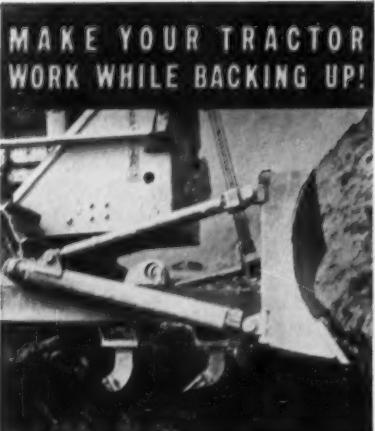
This new, fast, highly stable carrier is available for HC-98 and HC-108 truck-cranes. Prime factor behind its development was meeting state road restrictions . . . easing paperwork and minimizing delays in job-to-job travel. The carrier itself is fabricated from heavy, extra-strength alloy steels. Tandem rear wheels feature full-floating walking beam support which allows wheels to follow uneven terrain . . . maintain full traction at all times . . . increase stability.

14.98

It's time to compare . . . with

LINK-BELT SPEEDER

Builders of a complete line of shovel-cranes . . . with exclusive Speed-o-Matic power hydraulic controls



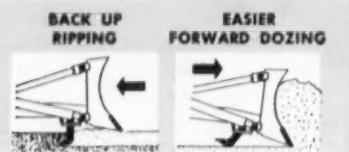
PRECO Back-Rippers



These powerful Rippers work while the tractor is backing up. They convert the bulldozer's deadhead time to work time—conditioning the ground for easier, faster dozing on the next forward pass.

Thousands of Preco Back-Rippers are in use around the world. They save time and have replaced other equipment in building pioneer roads, clearing land and rights-of-way, in gravel pit operations, slate breaking in coal strip mines, mounted on pusher tractors for faster scraper loading, for logging operations and many other uses. Quickly installed on most straight and angling blade bulldozers.

See your Caterpillar Dealer or send the coupon for information.



Preco Back-Rippers are completely automatic in operation—they dig in on the back-up trip and ride on the surface when going forward. There are no controls and, when desired, they can be locked up out of the way.



PRECO INCORPORATED
6300 E. Slauson Avenue
Los Angeles 22, Calif.

Name _____

Address _____



JOB TALK... continued



MASSIVE 182-ft length of 15-in. tubing is tested at three times working pressure.

flated at one end through an ordinary valve at pressures from 25 to 85 psi, depending on the size. Tubes are held at intervals in the form by various devices that can be withdrawn while the concrete is green. However, a permanent device such as wires tied to reinforcing sometimes is preferred. When concrete sets, tubes are deflated and withdrawn.

In post-tension work, tubes are withdrawn from cable ducts, permitting a high bond to develop between grout and concrete. And there is the additional advantage of casting beams prior to delivery of prestressing cables.



Flashy Streams

Harass Sewer Work

Open-cut sewer work on Pittsburgh's vast new trunk system is tough. Pipelines must be laid in small but flashy streams, and

For more details about the...

NEW GUARANTEED AVAILABILITY PLAN

see a participating Blue Brute distributor

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An
air tool
on
free loan
if your
Blue Brute
needs
repair!



**BLUE BRUTE DISTRIBUTORS ANNOUNCE
NEW GUARANTEED AVAILABILITY PLAN**

The most important thing about an air tool is to keep it out on the job working.

That's why Worthington Blue Brute tools are built for ruggedness—for ability to stand up under day-in, day-out punishment.

Another progressive step in keeping Blue Brute air tools on the job has just been announced. Under the terms of a new Availability Plan, we will lend you an air tool free if any of your hand-held Blue Brute tools is in our shop for repair.

Greater tool stocks, parts inventories

To be sure the tool you need is there when you need it, we have recently enlarged our stock of standard air tools and accessories. We also carry a large inventory of parts so that repairs or replacements can be made quickly and inexpensively.

For greater profits keep your air tools on the job by (1) buying Blue Brute tools and (2) taking advantage of the Guaranteed Availability Plan. For complete details on the new plan, ask your nearby Blue Brute distributor for Bulletin G-2500.

H.7.6A

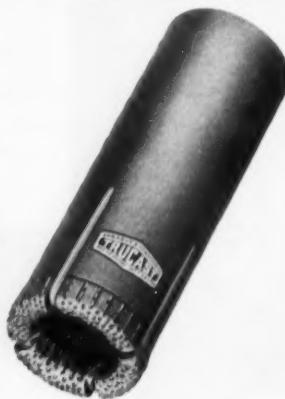
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lower YOUR COST per foot drilled



"ORIENTED" DIAMOND CORING BIT

Available in four different matrices and three different grades of correctly-sized diamonds. EX, AX, BX and NX sizes carried in stock. Larger sizes and special designs furnished to meet any specifications or requirements.



"M" SERIES "ORIENTED"
DIAMOND CORING BIT

For use with "M" SERIES Core Barrel, when good cores must be secured from soft or friable strata. Available in all four types of matrix and three different grades of diamonds. Also in a complete range of impregnated sizes. EX, AX, BX and NX sizes carried in stock.



"ORIENTED" DIAMOND "TAPER"
TYPE NON-CORING BIT

The fastest cutting bit for drilling blast holes in very hard formations. All standard sizes.

The one sure way you can do this is to specify or order Sprague & Henwood "Oriented" Diamond Bits. "Oriented" to give you better performance; and "Oriented" for minimum diamond loss. Thousands have been used in Sprague & Henwood's contract diamond drilling department, and thousands more have been supplied to its many customers. Completed contracts have produced lower costs and customers' re-order. Write for new Catalog No. 320-1 which gives the complete "Oriented" story, and illustrates and describes Sprague & Henwood's Diamond Bit Line.

RESETTING SERVICE

Send in your bits that need resetting, giving full details of results obtained and conditions under which the bits were used. Prompt, accurate and dependable service assures you that they will be returned new and with the diamonds "Oriented". Generally, reset bits are on their way back to the customer within three working days. In many cases, suggestions for improvements in bit performance can be made after inspection of your bits, provided full details covering their use have been received.

SPRAGUE & HENWOOD, Inc.

SCRANTON 2, PA.

Branch offices: New York • Philadelphia • Pittsburgh • Atlanta
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JOB TALK . . .

continued

sometimes equipment gets flooded before it can be removed.

Here, a Northwest backhoe moves ahead on mats, supported on material excavated from the other half of the stream. This excavation has the additional advantage of deepening the stream, which maintains the original flow capacity and helps reduce flood hazard.

Shale must be drilled and blasted before the trench can be excavated. This 5-mi section of the Turtle Creek interceptor consists of pipe ranging in size up to 36 in. The job is handled by Mole Constructors, Inc., a joint venture sponsored by Square Construction Co. of Baltimore, Md.



Device Turns Roller In Hardfacing Tank

A simple device developed by S. J. Groves Co. at its Syracuse, N. Y., maintenance shop enables a welder to rotate a half-submerged track roller while he applies hardfacing.

The roller is mounted in a frame set up inside a tank made from an old 400-gal drum. To rotate the roller, the welder presses a bar with the sole of his left foot, which rests on a piece of angle welded to the outside of the tank. Through a simple linkage, the moving bar actuates a steel finger which prods the rim of the roller, forcing it to turn.

Quenching the roller during hardfacing has several advantages. It lowers the temperature of the weld metal, prevents the inner workings of the roller from becoming overheated, eliminates distortion, and keeps grease and oil from heating and running out.

"EUC" S-12 SCRAPERS PROVE THEIR WORTH IN EVERY KIND OF DIRT

IN A CALIFORNIA DRAINAGE DITCH



ON A FLORIDA HOUSING SITE

... near Sarasota, S-12 Scrapers proved that they move more yards at lower cost—regardless of soil conditions or application. Working in hard loading beach sand the three S-12's of Howard Thomas Const. Co. obtained heaped loads of 14 to 16 yards. And, availability was 98% in contrast to the excessive downtime and maintenance costs of four cable-operated scrapers which these hydraulic S-12 Euclids had replaced several months earlier. The high production and availability of the "Eucs" helped this contractor complete the job ahead of schedule.

... for a disposal plant north of Freeport, A. Teichert & Son moved 400 yds. per hour with two Euclid S-12 Scrapers. Loading conditions were good and hauls averaged 700' to 1000'. About 80,000 yds. of earthmoving were involved in making the ditch 10' wide at the bottom and 35' wide at the top with 1:1 slope. Equipped with 10" sideboards, the 218 h.p. "Eucs" averaged 15 yd. payloads. Easy loading and fast travel speed of these dependable Euclid Scrapers made quick work of the job.



• Whatever your work—whatever kind of dirt—get a production-cost estimate on the S-12. Just check with your Euclid dealer... he can show you why Euclids are your best investment.

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio



Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE





**YOU CAN'T
BARGAIN
WITH SAFETY**

This 240,000-pound steam drum, built by Combustion Engineering for a large generating plant, is here being hoisted 120 feet into position by strong wire rope. It's a striking example of how ...

safety rides on quality wire rope

You may never hoist loads as large as this 120-ton drum. But *safe, top quality wire rope is just as important to your own operations.* For, although the price of a "bargain" rope would be less, failure of such a rope could cost you thousands of dollars in wrecked equipment. Don't be a victim of false economy. Buy a wire rope that's a quality rope—buy Wickwire Rope.

5339



**LOOK FOR THE
YELLOW TRIANGLE**

PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Casper • Denver • El Paso
Farmington (N.M.) • Fort Worth • Houston • Kansas City • Lincoln (Neb.) • Odessa (Tex.) • Oklahoma City • Phoenix • Pueblo
Salt Lake City • Tulsa • Wichita • PACIFIC COAST DIVISION—Los Angeles • Oakland • Portland • San Francisco • San Leandro
Seattle • Spokane • WICKWIRE SPENCER STEEL DIVISION—Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.)
New Orleans • New York • Philadelphia



Built to dig...

WILLIAMS BUCKETS

The most complete range of sizes in contractors'

dragline



buckets; also the famous Wellman-built



clamshell and



Williams industrial buckets



for bulk materials handling applications.



WILLIAMS BUCKET DIVISION — THE WELLMAN ENGINEERING CO. — CLEVELAND 4, OHIO

**"DEWATER
SANDSTONE
WITH WELLPOINTS?
IT CAN'T BE DONE!"**



"STANG DID IT!"

Holding back the mighty Mississippi is a king-sized job anytime, but it posed a particularly tough problem on the St. Anthony Falls Lock and Dam project. The job called for dewatering and support of a crumbly, porous sandstone material on the very edge of the river and immediately adjacent to the cellular cofferdam. The prime contractors Johnson-Kiewit, together with the U.S. Army Engineers supervising the project, made a daring decision. They called for Stang wellpoints to eliminate the serious piping which developed from the river, under the cellular cofferdam and on into the excavation area.

They banked on Stang's versatility and it paid off. The wellpoint installation was highly successful; not only eliminating the piping condition, but actually lowering the water table below the deepest subgrades.

Call on STANG engineers for experienced services and special equipment to solve your water handling problems—any size, any type, *anywhere!* STANG engineers are on call in your area for consultation day or night.



WRITE FOR BULLETIN 100B

JOHN W. STANG CORPORATION

Engineers and Manufacturers of Dewatering Equipment, Wellpoint and Pumping Systems
Dewatering Planning—Equipment—Service

BELL, CALIFORNIA
8221 Atlantic Avenue
Telephone: LUDlow 2-7421

OMAHA, NEBRASKA
2123 South 56th Street
Telephone: Walnut 7796

TACOMA, WASHINGTON
2339 Lincoln Avenue
Telephone: Fulton 3-3438

TULSA, OKLAHOMA
4026 South Urbana Street
Telephone: Riverside 2-6929



THIS NEW CAT* DIESEL WAS SOLD 25 YEARS AGO

"A quarter of a century ago, we purchased the first Cat Diesel Sixty-Five Tractor made. We always have favored Caterpillar-built equipment because of its stability and dependability. In day after day running, you

don't beat them for long life and minimum of down time."

JIM SHELDON, General Superintendent
Harms Bros., General Contractors, Sacramento, Calif.

The Caterpillar D397 powering this asphalt batching plant was sold on the performance of equipment used for the past 25 years. When Harms Bros. needed a dependable power plant for its Madsen asphalt batch plant, with a capacity of 5,000 pounds per batch, long experience had sold them on the dependability of Caterpillar Diesel Engines.

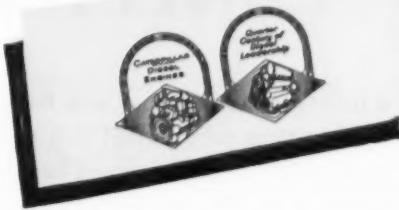
Yet this D397, rated at 650 HP (maximum output capacity), is even a better engine than previous models. It has higher horsepower. It is available with turbocharger, Roots blower, or in naturally aspirated or spark-ignition models. You have a choice of air, electric or gasoline starting.

There is a complete line of modern, heavy-duty Cat Diesel Engines to fit your every need. All of them come to you with honestly rated *certified power*. See your Caterpillar Dealer today for the exact size to fit your job.

Caterpillar Tractor Co., Peoria, Ill., U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.



THE LATEST, MOST COMPLETE
INFORMATION ON THE NEW
HIGHWAY PROGRAM — FREE



Here in one booklet is all the latest information on the new highway program. Find out how, where and when the money will be spent; standards for the new freeways; final routes of the Interstate System. Everything you need to know to share in the greatest construction job in history.

Dept. CME-5-2, Caterpillar Tractor Co., Peoria, Ill.

Please send me immediately _____ copies of "The Road Ahead."

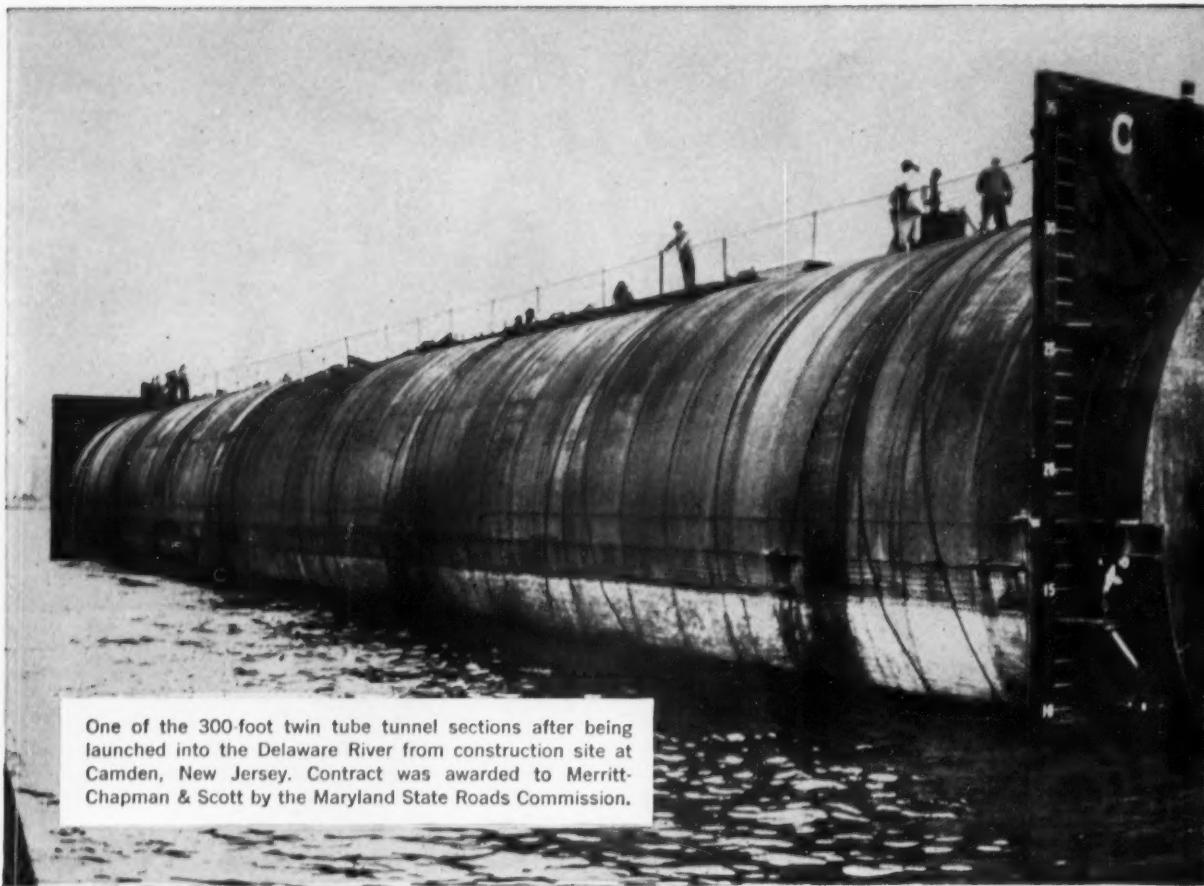
Name _____

Company _____

Address _____

City _____

State _____



One of the 300-foot twin tube tunnel sections after being launched into the Delaware River from construction site at Camden, New Jersey. Contract was awarded to Merritt-Chapman & Scott by the Maryland State Roads Commission.

Gulf Products help avoid delays on

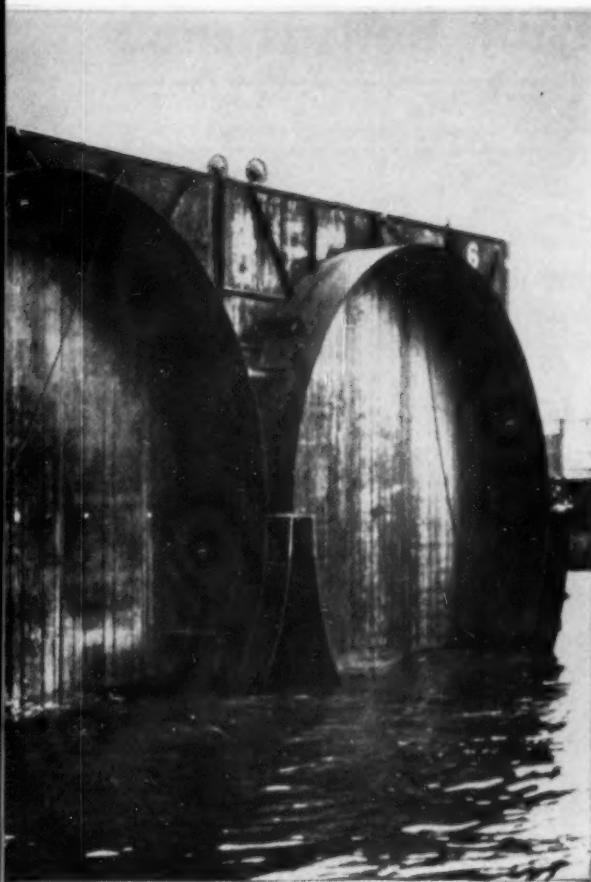
Here's a 6300-foot tunnel that was floated into position! It's a twin tube tunnel that will carry four lanes of traffic under Baltimore harbor, linking route U.S. 1 on the south with U.S. 40 on the north. Merritt-Chapman & Scott are the contractors on this 30 million dollar job.

The steel core of the trench-type tunnel is made up of 21 twin tube sections, each 300 feet long and lined with concrete. The sections are fabricated ashore, floated into position, sunk in a dredged trench and covered with backfill. Then

watertight bulkheads are removed and interior work—tiling, lighting, road surfacing—is completed. The tunnel is 103 feet below the surface of the Patapsco River at its deepest point.

The steel tubes were fabricated under subcontract by Bethlehem Steel, Maryland Drydock Company and New York Shipbuilding Corporation, a subsidiary of Merritt-Chapman & Scott. Use of Gulf quality petroleum products on this job enabled the contractors to be sure of prompt deliveries, avoid mechanical delays and keep their

THE FINEST PETROLEUM



Shape-up basin where sections are fitted with inner ring of concrete and roadway slab prior to being towed to position and sunk into the river-bottom.



Southern end of tunnel in position on the river bottom and ready for road surfacing, tiling, and other final interior work.

and Fine Service Baltimore Harbor Tunnel Project

equipment operating on schedule. Why not do the same on your next job? Write today for a copy of "Gulf and Your Business," and Gulf's revised lubrication and maintenance manual, "Contractors Guide."



PRODUCTS FOR ALL YOUR NEEDS

Gulf Oil Corporation

1822 Gulf Building, Pittsburgh 30, Pa.

Without any obligation on my part, send me a copy of:

"Gulf and Your Business"
 New "Contractors Guide" (lubrication and maintenance manual)

Name _____

Title _____

Company _____

City _____ Zone _____ State _____



AIR HOSE



This is the hose recommended for all pneumatic tools and air drills—for use wherever high working pressures, abrasion and general abuse would wreck an ordinary air hose.

Heavy tools can drop on it. Pieces of rock from blasting can strike it. It can be pulled over jagged stones, grinding gravel—in all kinds of weather. *Throughout all this, U. S. 4810 stays unharmed, delivers full service.*

U. S. 4810 combines super adhesion and extreme flexi-

bility. The rugged service that this hose provides throughout its long life proves that you are wasting dollars if cheaply constructed, short-lived air hose is being used instead of U. S. 4810 Air Hose.

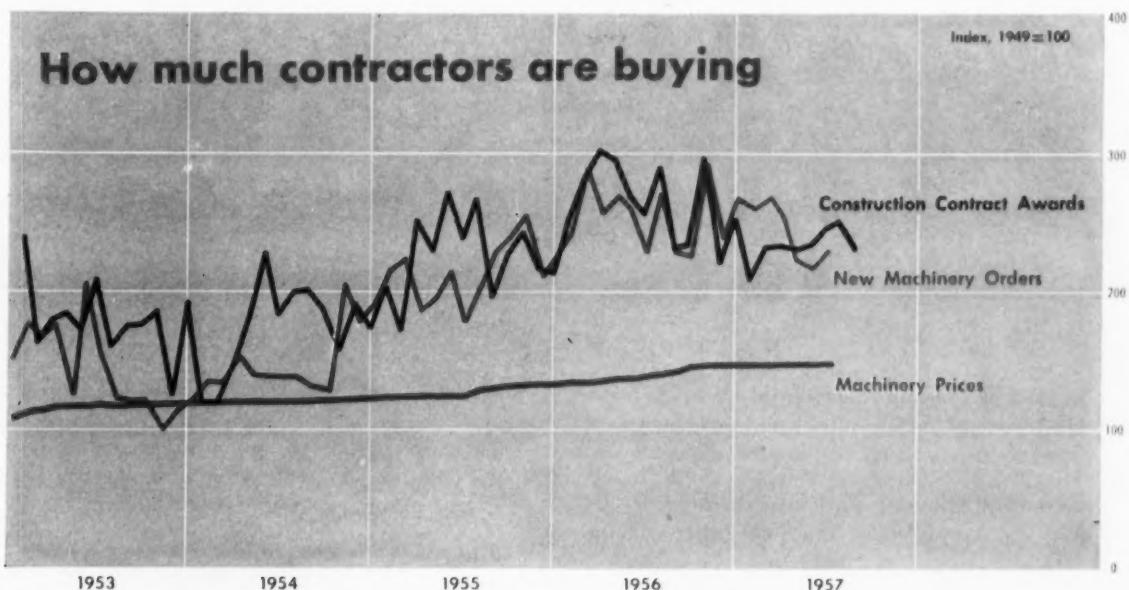
A complete line of hose is obtainable at any of the 28 "U. S." District Sales Offices, at selected distributors, or by contacting us at Rockefeller Center, New York 20, N. Y. In Canada, Dominion Rubber Co., Ltd.



Mechanical Goods Division

United States Rubber

Construction Machinery Price Trends



Price Index

	JULY 1957	MONTH AGO	YEAR AGO	PERCENT CHANGE 1956-57
All Types of Equipment	157.7	157.6	147.8	+ 6.7
Cranes, Draglines, Shovels	159.6	159.5	148.4	+ 7.5
Shovel, 1/2 cu yd	150.9	150.9	142.8	+ 5.7
Shovel, 3/4 cu yd	162.9	162.9	154.0	+ 5.8
Shovel, 1-1/2 cu yd	172.4	172.4	160.1	+ 7.7
Shovel, 2 cu yd	143.7	143.7	131.9	+ 8.9
Shovel, 3-3/4 cu yd	158.3	158.2*	147.2	+ 7.5
Shovel, 6 cu yd	173.2	173.2	161.2	+ 7.4
Crane, truck mounted	162.1	162.1	153.7	+ 5.5
Bucket, clam shell	152.7	152.7	136.7	+ 11.7
Bucket, dragline	180.8	180.8	165.1	+ 9.5
Crane, tractor mounted	131.7	126.6	120.3	+ 9.5
Scrapers and Graders	150.1	150.1	141.6	+ 6.0
Scraper, 4 Wheel, 8-8.4 cu yd	155.0	155.0	140.0	+ 10.7
Scraper, 4 Wheel, 14.4-15.2 cu yd	143.9	143.9	133.2	+ 8.0
Scraper, 2 wheel	113.6	113.6	107.0	+ 6.2
Grader, heavy duty	154.9	154.9	146.2	+ 6.0
Grader, light & medium	152.2	152.2	145.0	+ 5.0
Tractors	169.3	169.3	157.8	+ 7.3
Wheel type, off-highway	118.6	118.6	111.2a	+ 6.7
Crawler type, 37.0-45.1 hp	172.3	172.3	157.2	+ 9.6
60.5-75.0 hp	176.1	176.1*	160.3	+ 9.9
102.0-116.0 hp	172.3	172.3	163.6	+ 5.3
126.0-155.0 hp	178.3	178.3	170.0	+ 4.9
Machinery, Tractor Mounted	155.8	155.8*	145.2	+ 7.3
Dozer, cable control	149.0	149.0	149.4	- 0.3
Dozer, hydraulic control	170.6	170.6	153.9	+ 10.9
Cable, power control unit	139.9	139.9	131.8	+ 6.1
Loader, shovel type	148.1	149.1	136.8	+ 8.6
Specialized Machinery	144.6	144.6	135.6	+ 6.6
Ditcher	151.8	151.8	140.8	+ 7.8
Roller, tandem	181.7	181.7	164.9	+ 10.2
Roller, 3 wheels	154.8	154.8	146.4	+ 5.7
Ripper and rooter	138.1	138.1	121.8	+ 13.4
Dewatering pump, 10 M gph	108.1	108.1	105.4	+ 2.6
Dewatering pump, 90 M gph	133.3	133.3	124.3	+ 7.2
Portable Air Compressors	146.2	146.2	133.2	+ 9.8
Contractors Air Tools	153.6	150.0	150.0	+ 2.4
Mixers, Pavers, Spreaders	143.1	142.6	134.2	+ 6.6
Mixer, port., 11 cu ft	151.7	151.7	145.3	+ 0.8
Mixer, port., 16 cu ft	153.6	153.6	144.8	+ 6.1
Mixer, truck, 4 1/2 cu yd	122.1	122.1	113.7	+ 7.4
Mixer, paving, 34 cu ft	176.2	176.2*	153.7	+ 14.6
Concrete finisher	171.1	166.3	158.0	+ 12.1
Bituminous distributor	115.9	115.9	108.3	+ 7.0
Bituminous spreader	160.3	160.3	149.9	+ 6.9
Bituminous paver	149.8	149.8	143.9	+ 4.1

a Index based on January, 1955 = 100 * Revised
BLS Primary Market Price Indexes, U.S. Department of Labor, 1947149 = 100

Contractors Order More New Machines

Contractors ordered more dollars' worth of new construction machines in July than ever before in that month. July orders topped June by 12%, according to the McGraw-Hill New Orders Index. This is the first month-to-month increase since March. Moreover, July is the first month since February to top the corresponding month of last year. Machinery orders were 5% higher than in July 1956.

The New Orders Index for July climbed to 238, based on 1949 = 100. Though this was below the average for the first six months of the year, it marked the end of a three-month decline. This upturn in contractors' orders was anticipated by Construction Methods because heavy construction contracts were rising during the second quarter while orders were dropping (CM&E, May, 1957, p 51). Furthermore, manufacturers expect contractors to continue to increase their orders for new machines during the rest of this year.

Manufacturers upped prices on four of the 43 types of construction machinery included in the July price index reported by the Bureau of Labor Statistics. These changes nudged the BLS Construction Machinery Price Index up from 157.6 in June to 157.7 in July, based on average prices in 1947-49 as 100. Though this amounts to less than a 0.1% rise in the month, the July index for all types of machinery is 6.7% higher than a year ago.

Prices indexes for the four types of machinery that posted higher prices last month show these changes: crawler cranes, up 4%; paving breakers (included in the Air Tool category), up 3.4%; concrete finishers, up 2.9%; and power shovels in the 3 to 3 1/2-yd size, up 0.1%.

Here's your answer to close bids and high costs:

Multiply your job range.....

Divide your rig investment..

Instead of sinking your capital in an old-fashioned "single-action" loader, let the same money buy four big-capacity International Drott 4-In-1 machine actions!

Instead of allowing profits to dwindle because an ordinary tractor-loader can't do 'dozer, scraper, or clamshell work, change to a 4-In-1! Move the machine-selector lever, right from the comfortable foam rubber seat, and watch your job-getting, profit-building potential go up and up!

You aren't getting just "another bucket"—but famous and exclusive Skid-Shovel® rock-busting, pry-

action break-out. And 41° bucket-heaping, ground-level roll-back. It's the one and only true pry-action! That means full hydraulic power transfer—correct pry-lever length—and exclusive frame-mounted skid-shoes to provide the vital fixed fulcrum!

And you're also getting easily-controlled, earth-rolling bulldozer action. Plus "carry-type scraper" action to grade, strip, or spread with inch-close accuracy. Plus super-speedy clamshell action, with bottom-dumping to eliminate the sticky materials problem. Plus the exclusive performance protection of shock-swallowing Hydro-Spring!

Invest only 15 concrete-smashing, earth-rolling, load-gulping, sod-stripping minutes! Prove to yourself that an International Drott 4-In-1 multiplies your job range, and divides your investment, by four! Prove you can't afford to handicap your future with any limited-duty rig—when you can command this versatility unlimited. See your International Drott Distributor for a 4-In-1 demonstration.



International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

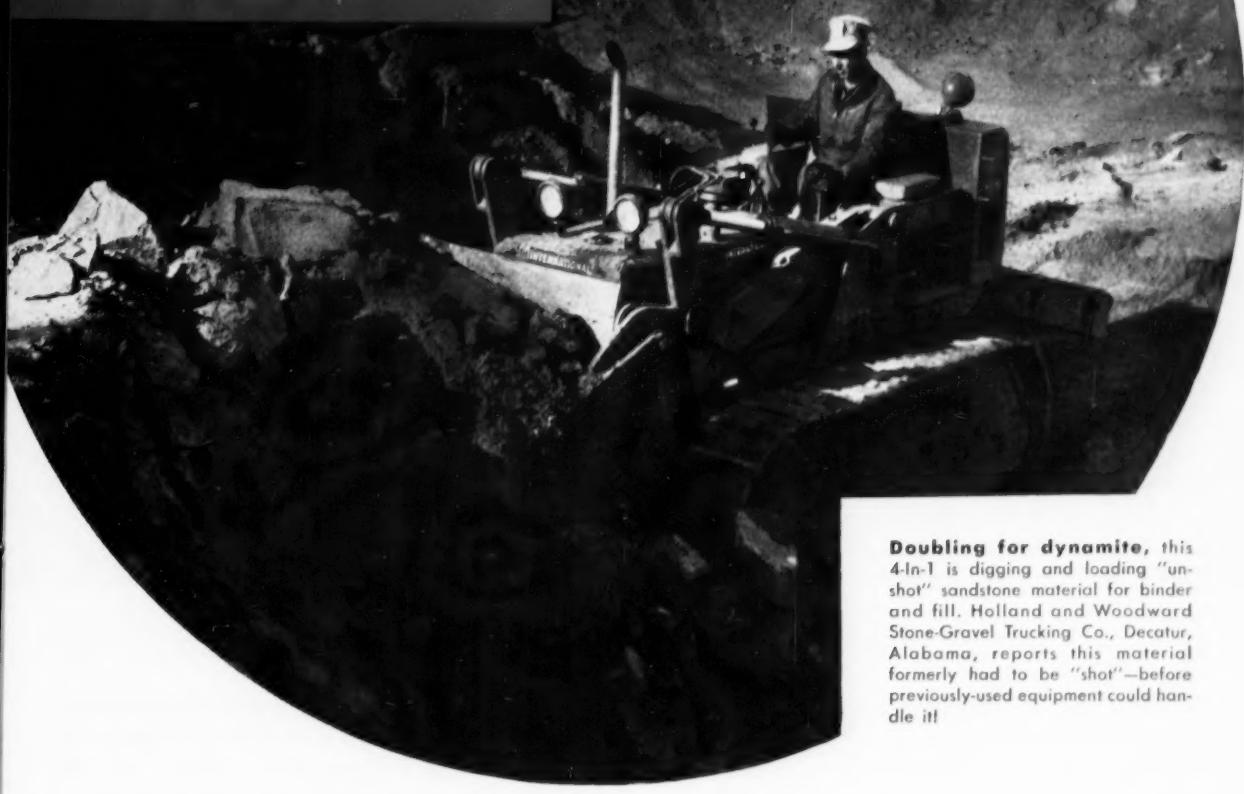
INTERNATIONAL
DROTT ®

► "Our International Drott 4-In-1 is a fine 'dozer—for stripping and pushing rock into the crusher hopper," reports Animas Valley Sand & Gravel Co., Durango, Colorado. "Besides, this machine is a better loader than those used before. And heavy lifting is easy with its clamshell!"

► Using 4-In-1 "carry-type scraper" action to fill the bucket on the go—a special advantage in depth-controlled grading or recovering and loading layered materials. "No limit to 4-In-1 versatility of operation," reports Stehle Equipment, Inc., Annapolis, Maryland—owner of the TD-14 4-In-1 shown.



...by FOUR
.by FOUR!



Doubling for dynamite, this 4-In-1 is digging and loading "un-shot" sandstone material for binder and fill. Holland and Woodward Stone-Gravel Trucking Co., Decatur, Alabama, reports this material formerly had to be "shot"—before previously-used equipment could handle it!

► **One-gulp bucket** fill of 4-In-1 as a clamshell permits picking up and loading, with ease, old tires, tree stumps, and similar "impossible" materials. Stockpile loading, too, is simplified with this "stand-and-fill" action. And the bottom-dumping clamshell gives a 2½-foot dumping height advantage over ordinary roll-forward buckets.

► **Equipped with Rock Fork** instead of 4-In-1 bucket, this TD-14 is loading rock for rip-rap on a dam near Jacksonville, Texas. Bull-angledozer, wood-handling Skid-Grapples, Grubber Blade, and Bulldozer are other attachments that multiply International Drott usefulness!



How a cost-beating, can "unbind"



A TD-24 starts and gets "ready to run," seconds-fast. Morning, noon, or any other time you shut down the TD-24's diesel engine, you restart in seconds—and save yard-moving, wage-costing minutes! Exclusive International gasoline-conversion diesel starting does it—and the combustion-heated engine is ready to run as a diesel, without "gumming the works" with raw fuel!

TD-24 Cerametallic engine clutch eliminates time loss and upkeep cost of temperature-sensitive, "service-nervous" type clutches! You get the simplicity of long-familiar clutch design. You get the operating ease, temperature-immunity, and power-transfer efficiency of International Cerametallic facings. You get the instant readiness to operate perfectly when cold—plus heat-defiance for clutch-mauling jobs like 'round-the-clock shuttle-dozing.

TD-24 on-the-go shifting is a "double-barreled" cycle-speeder. The exclusive TD-24 two-speed planetary system gives instant, stall-

preventing Hi-Lo shifting without declutching, in either the Torque-Converter or Gear-Drive models. And in the Gear-Drive model, you get two-direction "no-stop" shifting with exclusive synchromesh transmission.

TD-24 exclusive Planet Power steering eliminates load-limiting "dead-track drag"—gives full-time "live" profit power on both tracks. It's more than total engine hp or weight that

"The TD-24's 2-speed track steering holds you in 'dozing position with no slide-slip or power loss in turning," states Operator Jack Campbell for Owner J. H. Marshall, Clovis, New Mexico. The Marshall TD-24 is shown dozing tough caliche rock for road surfacing.



cycle-speeding TD-24

your profit squeeze!



Flores and Perry, Laton, California, depend upon three International "75" Payscraper® units and a TD-24 Torque-Converter crawler—to fulfill their 8-mile grade-raising subcontract, on

counts—watch how "dead-track drag" limits any king-sized steering-clutch crawler to what it can handle on turns. Then watch how years-proved Planet Power steering gives the TD-24 full-time, both-track power—to pull or push extra-big loads on the turns or straight ahead, uphill or down!

TD-24 control ease puts record daily production at your operator's fingertips. Cool and safe flush-deck design, control-tower vision, and

Central Valley Highway south of Hanford. TD-24 push helps boil-in 20 cu yd heap-loads, in only 42 seconds!

reach-easy fingertip controls all increase operator comfort and performance. Never before has big crawler work-power been so load-responsive—or record work-production so easy to achieve!

Prove positively your profit-margin widens—with geared-and-steered-for-action TD-24 power giving you the success-margin of push or pull! See your International Construction Equipment Distributor for a TD-24 demonstration!

"The TD-24's 2-speed track steering holds you in 'dozing position with no slide-slip or power loss in turning,' states Operator Jack Campbell for Owner J. H. Marshall, Clovis, New Mexico. The Marshall TD-24 is shown dozing tough caliche rock for road surfacing.



**INTERNATIONAL®
CONSTRUCTION
EQUIPMENT**

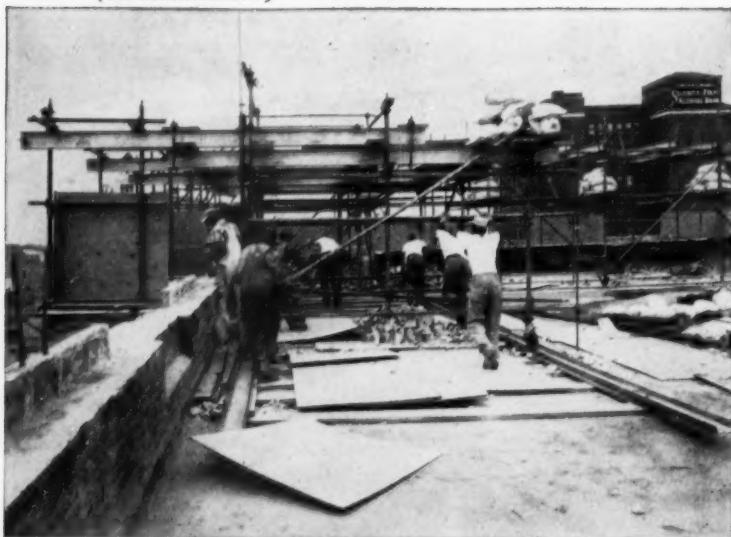
International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors... Self-Propelled Scrapers... Crawler and Rubber-Tired Loaders... Off-Highway Haulers... Diesel and Carbureted Engines... Motor Trucks... Farm Tractors and Equipment.

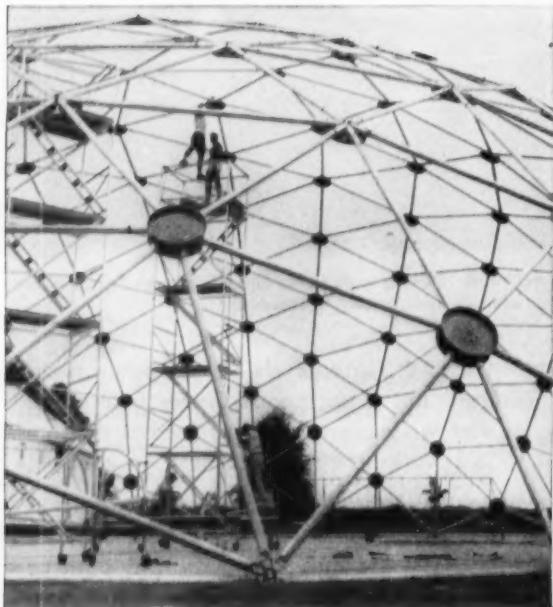


Scaffolding Methods . . .

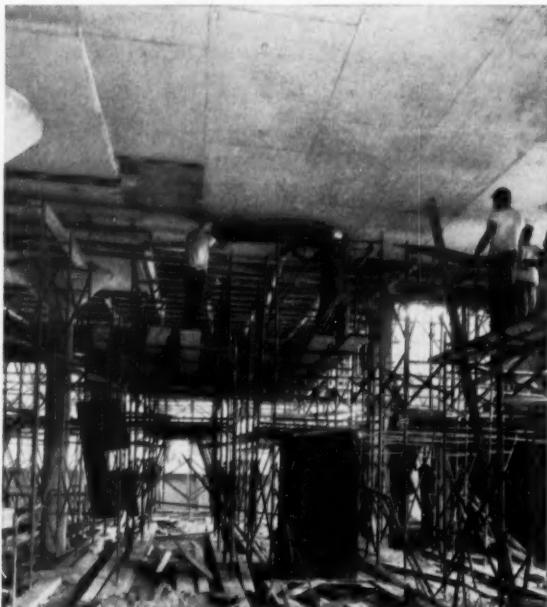
A Picture Report
on Efficient Ways
to Scaffold, and Shore
Concrete . . . by
Patent Scaffolding Co.



ROLLING CANTILEVER—Sam M. Duff, contractor, quickly removes cornice from Barker Brothers Building, Long Beach, Calif. from "TubeLox"® Scaffolding hung from cantilevered, rolling I-beam structures. Note channel tracks for easy movement and counter-weight. This method, selected because permanent sidewalk canopy prevented use of built-up scaffolding, shows how a minimum amount of equipment can effectively perform the job.



"DOME" WORK FROM TOWERS—Working from 30' Model B Aluminum Sectional Rolling Scaffolds and from the ground, men of Geodesics, Inc., erect this frame for a 100' diameter dome in two days. Nylon tent attaches inside frame. Dome is for United States Industries Exhibits Pavilion, International Trade Fair, Kabul, Afghanistan.



"BUILT-IN" SCAFFOLDS—Stripping concrete forms is fast and simple when "Trouble Saver"® Sectional Steel Shoring is used to support slab construction. Workmen for Woerfel Corp., general contractor, get right up to the work on the same equipment used during pouring of new two-story, 120' x 120' City of Milwaukee 7th St. Storage Garage.

FOR GREATER SAFETY...EFFICIENCY...ECONOMY



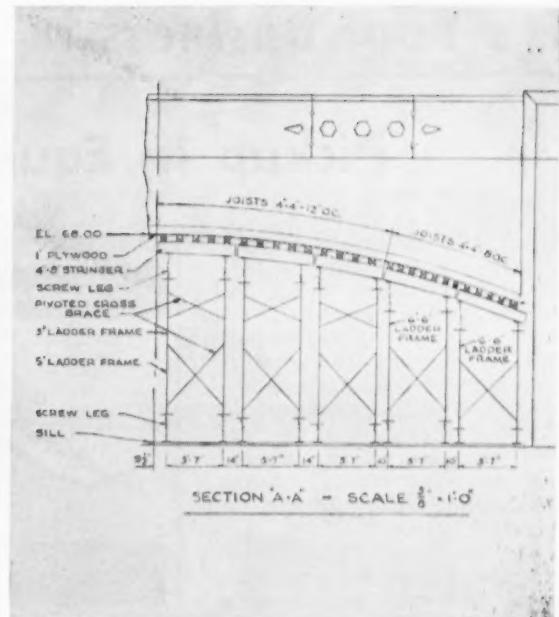
THE PATENT SCAFFOLDING CO., Inc.

38-21 12th Street Dept. CM&E Long Island City 1, N.Y.
West Coast: 6931 Stanford Ave., Los Angeles 1, Calif.
In Canada: 355 Dufferin St., Toronto
Branches in all principal cities

To help you with your scaffolding and concrete shoring methods, PS offers a complete nation-wide engineering service available to you locally. See the Yellow Pages in your 'phone directory for the nearest Patent Scaffolding office or representative that sells and rents "Gold Medal" Scaffolds.



SIMPLE BRIDGE SHORING — Light-weight, easily-erected, prefab sections of "Trouble Saver" Steel Shoring eliminate heavy timbers (and cranes to handle them) for contractor, Matthew J. Reiser, Inc., on this job. 146 2'-wide ladder frames, 105 5'-wide frames and 196 14" U-heads provide ample support with minimum equipment for overpass on an exit road from the Wilbur Cross Parkway, Wethersfield, Conn.

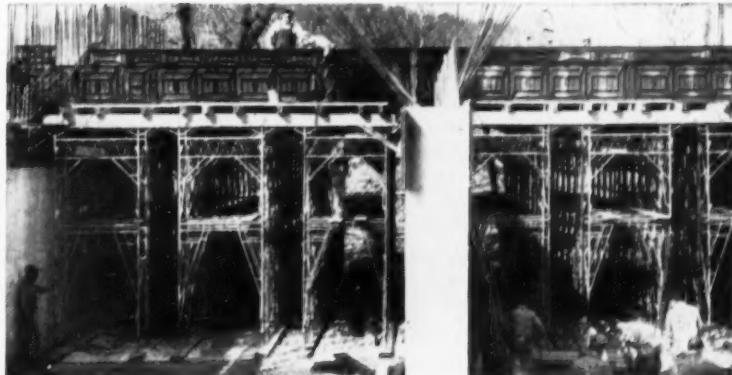


PS Co. ENGINEERED LAYOUTS — Complete, accurate shoring layouts are a regular part of PS Co's engineering service available thru nation-wide offices or representatives that sell or rent "Gold Medal"® Scaffolds. See classified 'phone directory for your local source. Included are recommendations for joists, stringers, and every component to provide the safest, most efficient and economical shoring.

Shoring Methods . . . for Highway Construction by The Patent Scaffolding Co., Inc.



DUAL PURPOSE — Here, "Trouble Saver" Scaffolding speeds erection of formwork for above-ground pier shells and supports platform for vibrating machines and workers on a New York State Thruway overpass.



CUTS SHORING COSTS 25% — Mal-Bros Co., contractor on this street relocation bridge in Scotch Plains, N.J., formerly used only wood shoring methods. On this project "Trouble Saver" Steel Shoring was used. 272 frames, quickly assembled in 3' by 5' towers and in rows spaced 2' apart, provide faster, easier shoring for the job. The contractor reports savings of 25%.

FOR GREATER SAFETY...EFFICIENCY...ECONOMY



THE PATENT SCAFFOLDING CO., Inc.

38-21 12th Street Dept. CM&E, Long Island City 1, N.Y.

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Branches in all principal cities

GET NEW HIGHWAY BULLETIN G208 NOW!

Full details on cost-cutting ways to use steel shoring and scaffolding on road jobs.

The Patent Scaffolding Co., Inc.

38-21 12th Street, Dept. CM&E, Long Island City 1, N.Y.

Name _____

Company _____

Address _____

City _____

Zone _____ State _____

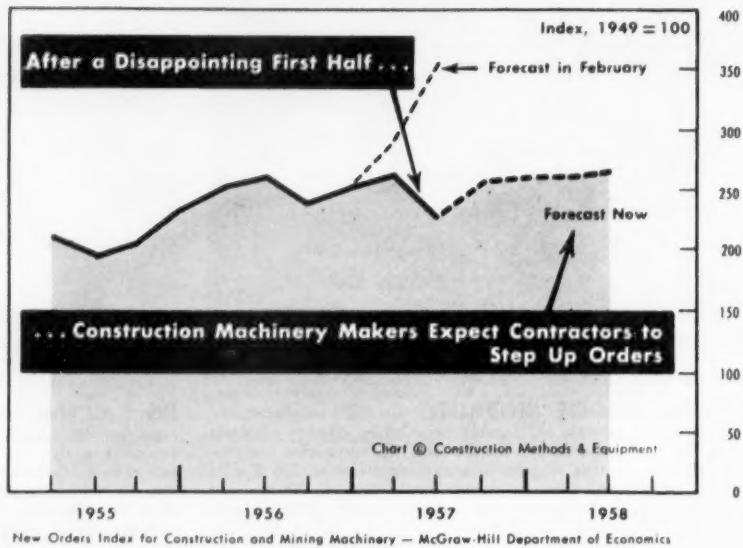
It's Your Business...

Pickup in Equipment Orders

CONSTRUCTION machinery makers are forecasting a 12% rise in new orders during the July-September quarter compared with the April-June period. Furthermore, the companies reporting their forecasts to the McGraw-Hill Department of Economics indicate that they expect contractors to keep increasing their orders gradually during the last quarter of 1957 and the first half of 1958.

The volume of new orders received during the first six months of this year was disappointing to many machinery manufacturers. The chart shows how orders in the first two quarters of 1957 were well below the manufacturers' predictions made in February. In fact, the New Orders Index for construction and mining machinery declined in the second quarter of 1957 to its lowest point since 1955. The index at 229 for this period (based on 1949 = 100) was 35% below the February forecast.

For the first half as a whole, new orders for machinery dipped 4% below the first six months



last year. But they were about equal to the volume ordered in the last half of 1956.

The latest forecast, covering the last six months of 1957 and first half of 1958, predicts that the July-December order volume will be 5% greater than the dol-

lar value booked in the first half. A further rise of 2% is forecast for the first six months of 1958.

Orders started off at a fast clip in the third quarter with July racking up a 12% increase over June and a new record for the month.

Heavy Construction Contract Forecast: 1958

Preliminary forecast in millions of dollars

Type of Work	1957 Estimate (Based on First 8 Mos.)	1958 Forecast Dollar Volume	Percent Change 1957-58
All Heavy Construction	\$19,350	\$19,250	- 0.5
Other Than Buildings	7,900	7,950	+ 1
Waterworks	390	425	+ 9
Sewerage	560	625	+ 12
Bridges	725	725	0
Highways	3,200	3,500	+ 9
Earthwork, dams, hr., drainage, waterways	1,075	825	- 26
Unclassified, public*	1,200	1,000	- 20
Unclassified, private**	750	850	+ 13
Buildings	11,450	11,300	- 1
Public nonresidential	2,250	2,400	+ 7
" housing	650	550	- 15
Industrial building	3,250	2,950	- 9
Commercial building	2,000	1,900	- 5
Private mass housing	3,300	3,500	+ 6
By Ownership—			
Public, Total	10,050	10,050	0
State and Municipal	7,550	8,050	+ 7
Federal	2,500	2,000	- 20
Private	9,300	9,200	- 1

*Includes airports, military bases and tunnels, mainly.

**Includes pipelines, transmission lines and hydroelectric, mainly.

CM&E's Forecast Shows:

Business in 1958 Will Remain Good

The heavy construction market in 1958 will match this year's volume of new business, according to Construction Methods' preliminary forecast. Total dollar value of contract awards is expected to be \$19.3 billion compared to an estimated \$19.4 billion this year.

Contractors can expect a slight increase in new contracts for construction other than building with \$7,950 million forecast for next year. New records are predicted for waterworks, up 9%, sewerage and waste disposal, up 12%, and highways, up 9%.

Bridge construction contracts should hold at this year's volume

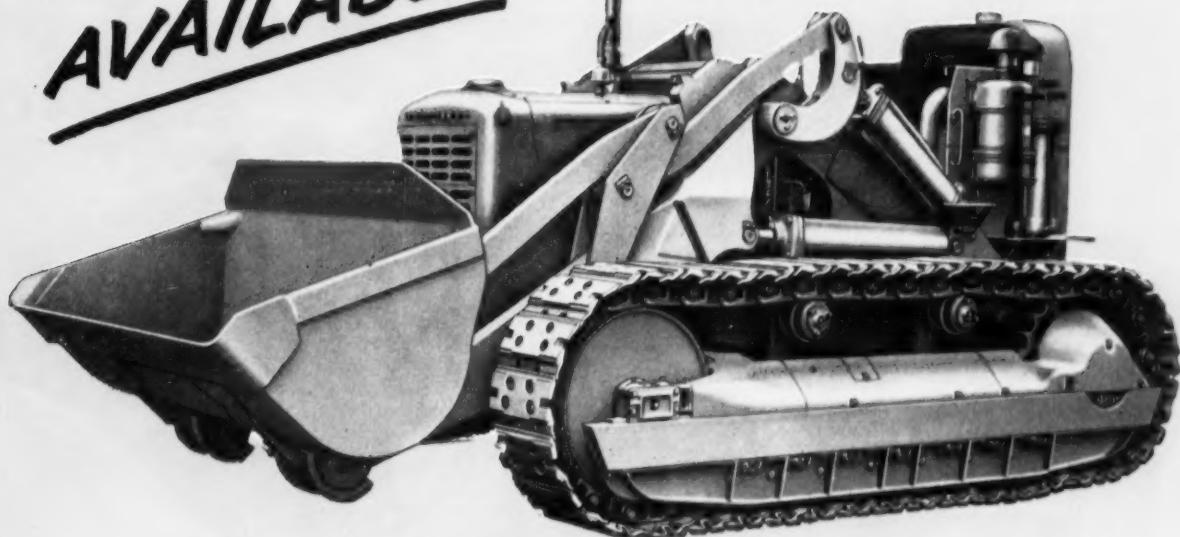
continued on page 52

HOLD EVERYTHING!

BIG NEW SERIES E TRAXCAVATORS*

**NOW
AVAILABLE**

**For the
extra-rough jobs**



The tough reliability of the No. 955 and No. 977 has already been field-proved. In the new Series E, these Cat-built Traxcavators give even greater performance in applications that put top stress on the guts of your equipment.

These CAT* Series E Traxcavators come equipped with a new heavy-duty, extra-sturdy undercarriage for longer life, lower maintenance costs, and better job production when the going is really bad.

You get—

- New heavier idlers*
- New solid sprockets*
- New and tougher track rollers with frames and guard of heavier construction*
- More ground clearance*
- Lower center of gravity for better handling and more stability*
- Lower transmission speeds for more bucking power*

No change in the maneuverability, big capacity and always dependable power of these great machines, of course.

For all the details on this improved Traxcavator line, phone your Caterpillar Dealer—same man you call for expert service and replacement parts that don't let you down.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co.

ONE GOAL: To concentrate our capabilities, resources and experience on the design, manufacture, distribution and service of job-tested heavy equipment.

without question, and with loads of proof



the P&H Miti-Mite is production and earning



WHEN YOU BUY a truck crane it will pay you to compare any make with the P&H Miti-Mite. This comparison will prove to you what thousands of contractors experience every day—the Miti-Mite out-performs any other small truck crane no matter what the attachment.

Compare these facts and figures: the Miti-Mite delivers its full rated capacity *around the*

full 360° for complete flexibility . . . the Miti-Mite is rated at 8-ton crane capacity at 12' radius . . . has an 11 cubic foot shovel capacity and a maximum trench hoe width. And for crane use the Miti-Mite can handle a 50 foot boom with a 15 foot jib. These are the features you want in a truck crane for real capacity and high earning power—you'll find them only in the P&H Miti-Mite.

unbeatable in power



TRENCH HOE

Gooseneck boom permits greater digging depths and dumping heights. Performs in rock, hard pan, heavy shales, works in laterals, septic tank areas.

CRANE

Exceptional stability means faster operation with greater safety. Planetary boom hoist is standard. Boom point of the gooseneck is open-throated for maximum boom load clearance. 8-ton capacity at 12' radius.

MAGNET

Handles 39-inch magnet with 5 kw. generator. Planetary boom hoist provides quick adjustment to any working angle.

CLAMSHELL

No need for lightweight buckets with a Miti-Mite—this versatile machine swings a standard construction bucket.

SHOVEL

16½-foot shovel boom is all-welded with box section design for maximum strength without weight. Electrically tripped dipper has 11 cu. ft. capacity. Positive chain crowd and retract mechanism.

HERE'S PROOF OF MITI-MITE'S EARNING POWER!

Harnischfeger Corporation, Dept. 1-F
Construction & Mining Division
Milwaukee 46, Wisconsin

Gentlemen:

Please send illustrated, certified, on-the-job performance reports proving Miti-Mite's extra capacity and earning power.

Name _____

Firm _____

Address _____

City _____ Zone _____ State _____

HARNISCHFEGER

Construction & Mining Division
Milwaukee 46, Wisconsin





Typical of today's modern highway construction is this view of the new Freeway in Oakland, Calif., showing 3 levels of highway structure over 2 levels of railroad.

(Photo courtesy California Division of Highways)

BIG CAPACITY—HEAVY DUTY MACHINERY is what you need to meet today's high production demands for both cement and specification aggregate . . . and that's what you get with the complete line of Nordberg Machinery . . . all backed by over a half century of specialized design and manufacturing experience.

This dependable line of heavy machinery has long been recognized throughout the cement, aggregate and construction industries for maximum, continuous production of big tonnages at lowest possible cost . . . including Symons® Gyratory and Cone Crushers for primary and fine reduction crushing; Symons Vibrating Grizzlies and Screens for scalping and sizing; Grinding Mills for wet and dry grinding; Kilns and Coolers; and a complete line of Nordberg Engines from 10 to over 12,000 horsepower to meet practically all power requirements.

Write for literature on the Nordberg Machinery you need to efficiently produce large tonnages of quality cement, aggregate and sand to meet the most rigid specifications.

NORDBERG MFG. CO., Milwaukee, Wis.

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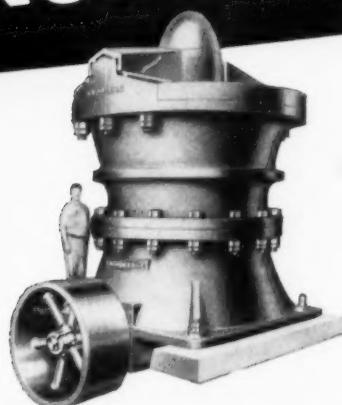
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MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS™

NEW YORK • SAN FRANCISCO • ST. LOUIS • DULUTH • WASHINGTON
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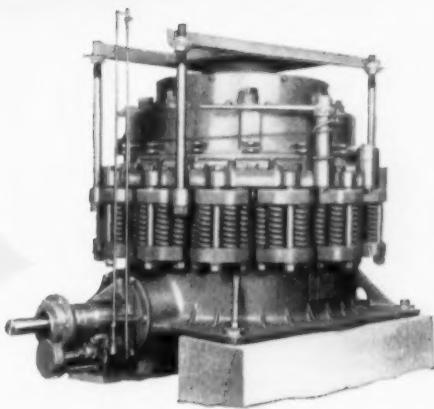
GET **BIG TONNAGES** OF CEMENT AND AGGREGATE WITH **NORDBERG MACHINERY**



SYMONS® GYRATORY and CONE CRUSHERS

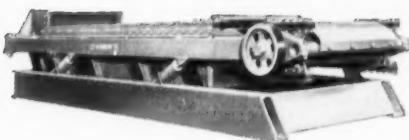
Gyratory crushers built in sizes from 30" to 72" feed openings, for capacities up to 3500 or more tons per hour.

Cone crushers built in Standard, Short Head and Intermediate types, in sizes from 22" to 7", in capacities from 6 to 900 or more tons per hour.



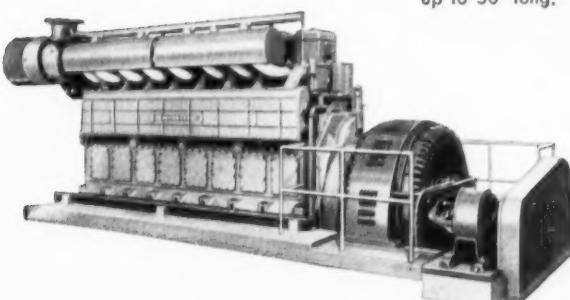
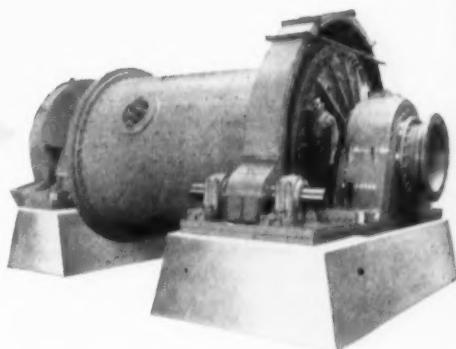
SYMONS VIBRATING SCREENS and GRIZZLIES

Built in a wide range of types and sizes to meet practically all requirements from heavy scalping to fine screening applications.



NORDBERG GRINDING MILLS

Include ball, pebble, tube, rod and compartment types for wet or dry, open or closed circuit operation. Sizes to 13' diameter and up to 50' long.

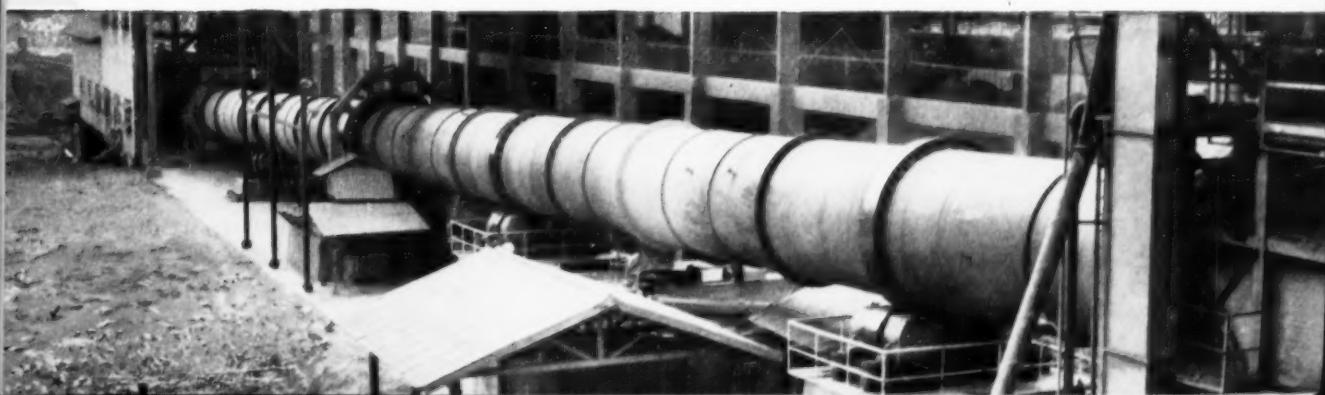


NORDBERG ENGINES

Built in a wide range of sizes from 10 to over 12,000 horsepower, including Diesel, Duafuel® and Spark-Ignition Gas types for low cost power generation.

ROTARY KILNS

Nordberg Kilns, Dryers and Coolers are built for pyro processing operations, calcining, burning and cooling.





AS A TRENCHOE — The model 510 C is powerful, compact, and perfectly balanced, it digs deep . . . trims corners neatly and squarely . . . cuts level floors and side walls without additional hand trimming.

AS A SHOVEL

The model 510 C performs with speed and precision. Has plenty of stability and produces maximum yardage.



ADDED to the UNIT Challenger $\frac{3}{4}$ yard line of excavating equipment is the new UNIT 510 C. This crawler type model features: One Piece Cast Gear Case . . . Self aligning Replaceable Hook Shoes . . . Force Feed Lubrication . . . Full Floating Trunnion Mounted Tapered Drums . . . Straight-in-line Engine Mounting with Torque Converter . . . Hydraulic Actuated Clutches and Automatic Traction Brakes . . . Interchangeability of Parts that simplify maintenance and cut costs . . . plus many other advanced engineering features.

And the safety promoting FULL VISION CAB enables the operator to SEE what he is doing at all times. Get all the facts. Write for your copy of Bulletin C 900.

UNIT CRANE & SHOVEL CORPORATION
6305 W. Burnham St. • Milwaukee 19, Wis., U.S.A.

Geared to Produce Maximum Yardage



CONSTRUCTION BUSINESS . . . continued from page 46

through next year. They now are very close to the 1953 record high.

Increasing awards for pipeline construction are expected to help lift the private unclassified construction total by 13% next year. Contracts so far this year have failed to live up to advance notices of the large volume of projects proposed. But many of the jobs that have been accumulating in the planning stage should go to contract next year, including the \$330-million natural gas pipeline from California to Washington and into Alberta, Canada, proposed in August by Pacific Gas & Electric.

Weak spot in next year's outlook is federal work which boomed this year. Contracts for federal dams and military construction (mainly airbase work) are forecast to drop below the 1957 pace. The economy drive by Congress and the Administration's announced policy of limiting new construction starts will affect 1958 federal awards. Furthermore, there is no prospect for such big federal projects as the whopping \$107.9-million Glen Canyon Dam, awarded this year.

But some of the slack left by lower federal contracts will be taken up by contracts for the New York State Power Authority's Niagara Power Project which is estimated to cost about \$450 million. Though a good part of this job may be awarded before the end of 1957, a large volume is expected to be awarded early next year. Total contracts for dams, waterways, drainage, and other river and harbor development will not measure up to 1957's estimated record volume of \$1,075 million, but the 1958 forecast of \$825 million means next year should be the second highest on record in awards for these types of work.

Slight Dip for Buildings

Contracts for heavy building construction are forecast at \$11,300 million in 1958 compared with the estimate of \$11,450 for this year.

Increases are expected in public nonresidential building, up 7%, and in private mass housing, up 6%.

Offsetting these increases, however, are declines forecast for industrial building, off 9%, com-



Give your engines a bonus in
BEARING STAMINA

In the toughest services, in high duty engines of all kinds, the value of extra bearing stamina really shows up . . . shows up in work records and in satisfied customers. And that's why there is no substitute for the

plus performance engineered and manufactured into Monmouth Micro* and Clevite 77* bearings! Made by the world's leading manufacturer of engine bearings. Stocked by N.A.P.A. jobbers everywhere.

*The words Monmouth, Clevite and Micro are registered trade marks of Clevite Corporation.

Monmouth

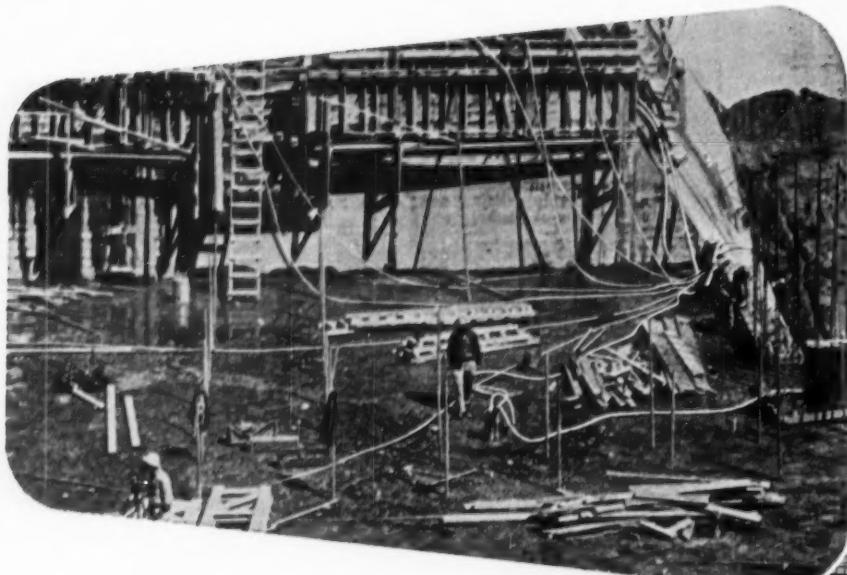
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ENGINE BEARINGS

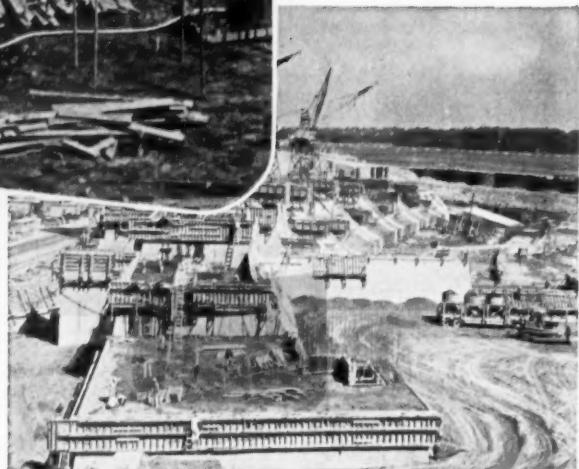
Clevite Service
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Division of Clevite Corporation, Cleveland, Ohio, U.S.A.



Your
NAPA Jobber
is a Good Man
to Know!



Gates construction
hose is used
extensively on one of
world's largest
engineering projects
—the St. Lawrence
Seaway.



The Gates Hose you want...when you want it!

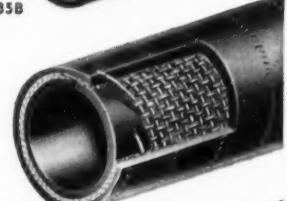
Gates distributor stocks are quickly available everywhere, and you can be sure of getting the right hose for any construction job. Three of the most popular types are:

35B Gates General Purpose Water Hose for long life in rough service. A superior hose for all types of wet-down service . . . for concrete making . . . for discharge on small pumps.

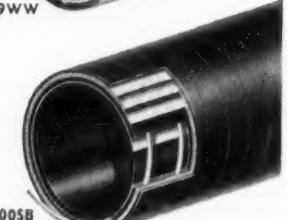
This hose is built especially for rough service under all kinds of weather conditions. And it won't chip or scuff off. High or pulsating water pressures are easily handled by Gates 35B. Extra long service life of this hose means money saved. Available in long continuous lengths . . . $\frac{1}{2}$ " through $1\frac{1}{2}$ " inside diameters.



35B



39WW



500SB

39WW Gates Water Suction Hose withstands extremely rough usage. An all-purpose heavy duty suction hose for use on intake side of any pump requiring hose up to 4" inside diameter. (Can also be used for discharge service.) Tough but flexible. Reinforcing wires and cords are interlaced to provide a strong, well balanced construction.

500SB Gates Heavy Duty Suction Hose with maximum crush resistance. Recommended for use on 4", 5" and 6" centrifugal, diaphragm and piston type pumps, this heavy duty hose has rugged spring steel wire and strong fabric reinforcing to make it practically crush-proof. Tube is compounded to handle abrasive fluids such as those encountered in sewer work. Made with inside diameters from 2" to 6".



The Gates Rubber Company
Denver, Colorado

The Mark of Specialized Research

TPA 165

Gates Construction Hose

CONSTRUCTION BUSINESS . . .

continued from page 52

mmercial building, off 5%, and public housing, off 15%. The fall-off in public housing is attributed to the military housing program for which contracts were unusually concentrated in the first half of 1957. The 1958 rate of awards is forecast at the more "normal" pace of lettings during the second half of this year.

Public Market Biggest

By contrast with 1955 and 1956 when private work accounted for the lion's share of the heavy construction market, public work has been the dominant factor this year and will continue to be in 1958. Federal work may drop 20% below this year's pace, but state and local public works contracts are predicted to rise 7% to a new all-time high.

This 1958 contract award forecast is founded largely on the trend in new proposed work entering the planning stage, as reported by Construction Methods. That's because this work makes up a large part of total contracts awarded.

This year, state and municipal work racked up a 6% increase over 1956 in the first eight months. The \$7 billion total represented work going into the planning stage which will come up for construction contract in the future—a year, two years and, for some projects, a longer period after the date it was reported proposed.

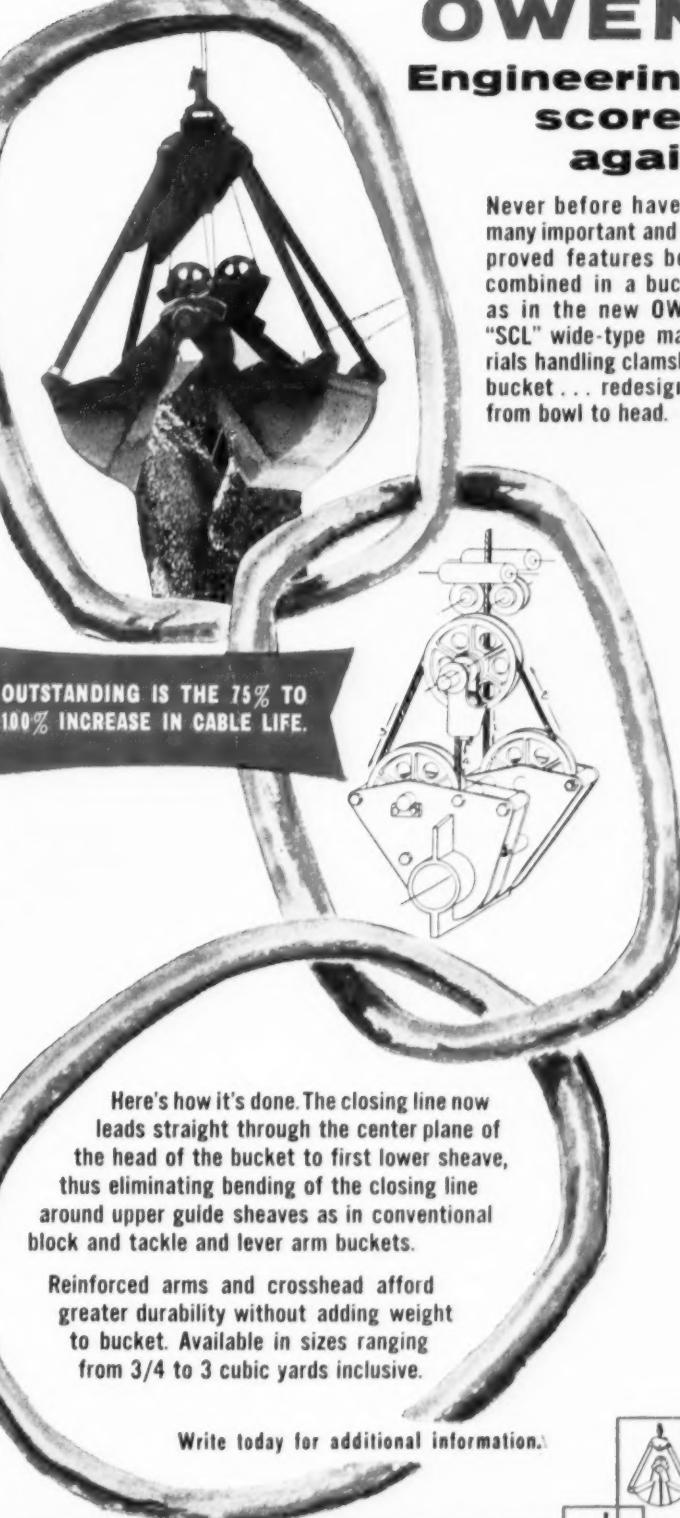
The increasing margin between this volume of proposed state and local work compared with the volume of the same type work moving out of the planning stage to contract indicates a continuing rise in total contracts during the next 18 months, at least.

By contrast, less private work has been proposed so far this year than in the 1956 period. In fact, the \$6.4 billion estimated cost of private projects entering the planning stage is 28% below the corresponding 1956 volume, and it's also less than the 1955 rate. This downturn in proposed private work shows signs of ending—August brought a sharp rise. But the low volume of private projects proposed earlier this year will hold down next year's contract volume.

Contracts Awarded on page 269

OWEN Engineering scores again

Never before have so many important and improved features been combined in a bucket as in the new OWEN "SCL" wide-type materials handling clamshell bucket . . . redesigned from bowl to head.



Here's how it's done. The closing line now leads straight through the center plane of the head of the bucket to first lower sheave, thus eliminating bending of the closing line around upper guide sheaves as in conventional block and tackle and lever arm buckets.

Reinforced arms and crosshead afford greater durability without adding weight to bucket. Available in sizes ranging from 3/4 to 3 cubic yards inclusive.

Write today for additional information.



The OWEN BUCKET Co. BREAKWATER AVENUE, CLEVELAND 2, OHIO

BRANCHES: New York • Philadelphia • Chicago
Berkeley, Calif. • Fort Lauderdale, Fla.

How seconds saved



Archie Campbell, Inc., New Rockford, N.D., used 4 C Fullpaks to move 700,000 yds. on improvement of 22 miles of N.D. Hwy. 30, south of Maddock. According to contractor's records, 60,000 pay yards of dirt were moved per 66-hr. week.



make extra profits



Sharp 90° turns out of the cut contributed to C Fullpak completing 2100' load-haul-spread-return dirtmoving cycles in average 3 min. 53 sec. while rebuilding U.S. Hwy. 52 for Blankenship Bros., Charlotte, N.C. Comparable competitive scraper averaged 4 min. 35 sec. for the same cycle.

Three C Fullpaks loaded 15 to 17 yds. of topsoil in an average of 58 seconds, for Brown & Lambrecht, Joliet, Ill.—grading for construction of an additional 2 lanes along 7 miles of U.S. 66, 30 miles southwest of Chicago.



Hugh McMath Construction Co., Columbus, Ga., weighed Fullpak loads up to 50,000 lbs. (17.8 pay-yards) in 2800 lb/yd sandy-clay gumbo, on 4.9-mile Tifton (Ga.) bypass job. Here, "C's" loaded in 75' in average of 33 seconds, hauled 550' in 64 seconds, spread 60' in 19 seconds, and returned 550' in 60 seconds for a total cycle of 1235' in 2 minutes and 57 seconds.



The difference between making a fair profit and breaking even (or maybe losing money) on dirtmoving jobs, is often a matter of seconds saved here and there in your scraper's cycle-time. Five or six seconds saved in the cut, a few less seconds spent on the haul road, four or five more saved on the fill, and a few more seconds cut off your return... all add up to more round-trips... extra pay-yards moved... and substantial increase in revenue per machine.

For example, if you've been hauling 12 loads per hour, and can cut just 20 seconds off each cycle, you get 40 minutes extra production in a 10-hour day... up to 120 extra pay-yards for each 18-*yd.* scraper. At 35c a yard, that's \$42 extra revenue... each day... on each rig... with no extra cost.

One way to do it

Take the new LeTourneau-Westinghouse C Tournapull® with 18-*yd.* Fullpak* scraper for instance. It saves on every cycle. It gets heaped loads easier, seconds faster... has more pep on the pick-up, gets going fast on a high-speed schedule. C Fullpak saves seconds because it maneuvers easily to reduce cycle distance, often works in footing that would stop other scrapers. It saves more seconds because it dumps clean, spreads accurately on-the-run... makes round-trips faster because operators feel safer, work at peak efficiency all day long. The payoff on extra speed that saves seconds is extra payloads... extra dollars.

Loads fast... heaps high

C Fullpak consistently loads fast, in short loading distance. Dirt flows easily into wide, low-bottom bowl. It packs back corners... "boils" up and forward, *high*

and wide, to heap jumbo payloads. Big, easy-target push-block concentrates pusher's full horsepower and tractive effort on blade, for maximum thrust. Quick-release on bowl-hoist lets your operator "pump" bowl rapidly up and down... get big loads, and save seconds in sand and other loose materials.

Scraper wheels, riding inside 9½' cutting width, hold Fullpak bowl low in the cut. With scraper bottom angled only 2°, dirt slides almost horizontally into bowl... most power is used for cutting, little for lifting load against gravity... a prime reason why you get big pay-loads and save time on every cycle.

Extra visibility saves wasted seconds

Fullpak's low yoke lets your operator clearly see cutting-edge, load, and pusher. He doesn't have to guess or rely on "feel". He can watch the pusher... apply loading power at exact moment of contact. Unobstructed view lets him control blade depth for fastest loading, lets him hoist bowl and "highball" for the fill the moment he gets a full load. Easy visibility also aids in maneuvering, and positioning the blade for a fast, accurate spread... lets your operator "take-off" back to the cut, the moment spreading is done.

**How extra speed makes
every yard cost less...
see next page**

(continued)

Extra speed
saves seconds...
earns extra
dollars



Rebuilding 3 miles of Manistee County road, Contractor Dan S. Parr, Manistee, Mich., found C Fullpak's short turn-radius a real time saver. Units borrowed sand, and spread on roadway...then swung around in tight U-turns on narrow road bordered by swamp and muck.

J. Tomei Construction Co., Van Nuys, Calif., moved 500,000 yards of granite dirt to prepare roads and terraces for homesites in 100-acre mountainside subdivision, near Arcadia, Calif. Three 18-yd. Fullpaks moved average of 5000 yds. daily over steep, difficult terrain.



Faster on the pick-up...

C Fullpak* has more pep...more get-up-and-go than other scrapers in the 12 to 18-yd. class. Seconds are saved as it accelerates to top operating speeds faster, because it carries less deadweight...less iron on its back than other makes of scrapers in its class. Empty, "C" weighs only 1.21 tons for each yard of heaped capacity. With this low weight-capacity ratio,

Tournapull wastes no power...cuts seconds from cycle time...reduces your cost-per-yard.

18-yd. Tournapull's 29.9 mph easy riding speed saves many seconds on long hauls. In all gears, LeTourneau-Westinghouse Tournapull® has extra power for quick acceleration to pull out of the cut, off the fill, away from stop-and-go conditions faster than other units. What's more, with less iron on its back, 'Pull' can frequently work in next higher gear than others.

Keeps "rolling" thru poor footing

Tournapull also has a traction advantage. It keeps the load moving in sand, mud, or loose materials, where many haulers can't go empty. Big footprint tires grip the ground to pull thru without sinking in. "C" works more days per year—in shut-down weather, earlier in Spring, later in Fall—because power-transfer differential maintains effective pulling-power on drive wheels, regardless of footing.

Whenever one wheel tends to spin on slippery or unstable ground, Tournapull differential *automatically* transfers up to 80% of pull effort to other drive-wheel on firmer footing. This saves valuable momentum...maintains power to pull thru, to haul steadily for more cycles per hour, more payloads per day. And with power-transfer differential *plus* geared-kingpin power-steer, you can "walk" unit out of bog-down footing...turn prime-mover left, right, left, right...pulling scraper ahead with every turn.



Nine Fullpaks helped move 775,000 yds. of dirt in mostly wet weather, on 3.7-mile rebuilding of Rt. 99, thru Ft. Lewis, Washington. Says Supt. Vizcarrillo of Northwest Construction Co., Seattle, "We can work our 'C's' where other rigs would never go. They're terrific loaders, and spread exactly where we need it. Electric controls are foolproof."

(continued)



advertisement



faster on haul and return

Speedy, clean dumping

Fullpak spreads evenly on the run . . . unloads all material fast, to accurate grade. With apron-lift to 6'1", chunkiest material clears easily thru 9½'-wide opening. Positive-ejection tailgate moves forward, completely cleans out even the stickiest muck from bowl. There is no haul back, no lost pay-yards on the next trip. Precise control and excellent visibility of blade, reduce time on the fill . . . make it easy to get a smooth, even spread, without a second's waste time.

Quick maneuverability

Short, fast turning ability of "C" also helps cut valuable seconds off each end of your dirtmoving cycle—even when there's plenty of turning area. 18-yd. Tournapull makes continuous 180° turns in space only 32'7" wide. Positive, electric-powered, geared-steer with 90° pivot at the kingpin, speeds turns in close quarters . . . reduces length of cycle . . . often eliminates waiting for clearance room or construction of turn-arounds.

Two-wheel prime-mover, rolling on big, job-rated, low-pressure tires, turns easily in any footing . . . climbs out of deep ruts, over boulders, or thru soft materials. Power-steering is smooth, effortless, foolproof, effective . . . unit saves seconds at every operator "command".

Instant-action controls

On C Fullpak, your operator not only steers . . . but also positions scraper bowl, apron and tailgate with the

smooth, clean, instant power of electricity. Any desired movement takes only a touch of a fingertip on an electric switch. Instantly, flexible, insulated cables carry electric power from generator to high-torque motors at point-of-action. Motors start, stop, or reverse in a split-second to give precise control of steering and scraper functions. No other control is so easy, fast, sure and safe. There's no hesitation . . . no waiting for power. You have perfect, instantaneous control that saves seconds on each cycle.

Operators hustle more yardage

With excellent all-around visibility, your operator moves dirt at Tournapull's higher speeds with confidence. Big ground-gripping tires make C Fullpak sure-footed under all conditions. Low center of gravity assures stability on hills and curves. Smooth, instant-acting, extra-large, multi-disc air-brakes provide safe control on any haul surface, in any weather. On narrow winding roads, on steep grades, near other equipment, operators are sure of control and maneuverability. They just naturally haul faster, return faster . . . hustle more yardage in the seconds saved in each hour.

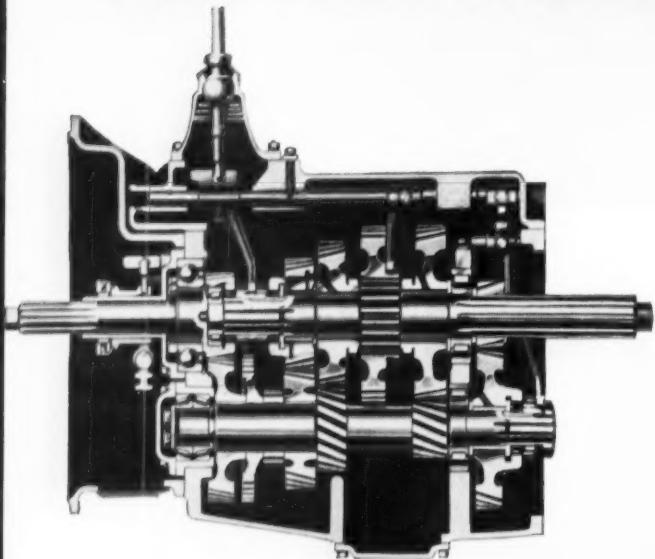
Bonus ways to boost
dirtmoving earning power
... see next page

*Trademark

(continued)

Save extra seconds...hours
...days...dollars with

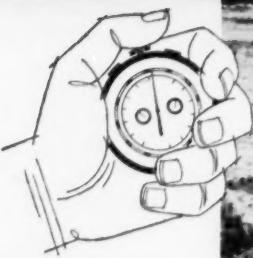
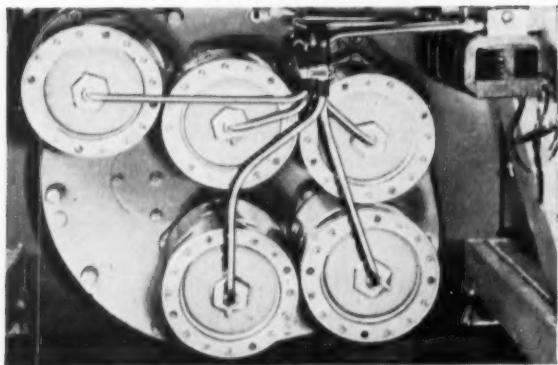
your choice of engine **and transmission**



Step-gear Transmission

Your choice:
Power-shift or
step-gear transmission
to save seconds on
your kind of jobs

Power-shift Transmission



For maximum productive returns on your investment in C Fullpak*, choose either power-shift or step-gear transmission. Your normal job conditions will determine which transmission will save seconds and move dirt faster...which will give you more payloads per day for more profit. The LeTourneau-Westinghouse Distributor will be glad to help you determine the most practical transmission for you.

5-speed step-gear

This conventional, manual-shift transmission is a Fuller 5A-1120, similar to that used on many 12 to 18-yd. self-propelled scrapers. It's geared to give you the extra pull-power you need during loading, and in starting the load...extra speed on good haul roads. With engine rpm of 2000, Fullpak works and travels at:

1st gear 2.9 mph 4th gear 19.0 mph
2nd gear 6.2 mph 5th gear 29.9 mph

3rd gear 10.8 mph reverse 3.8 mph
Optional ring-gears available for this transmission to increase top speed to 40 mph.

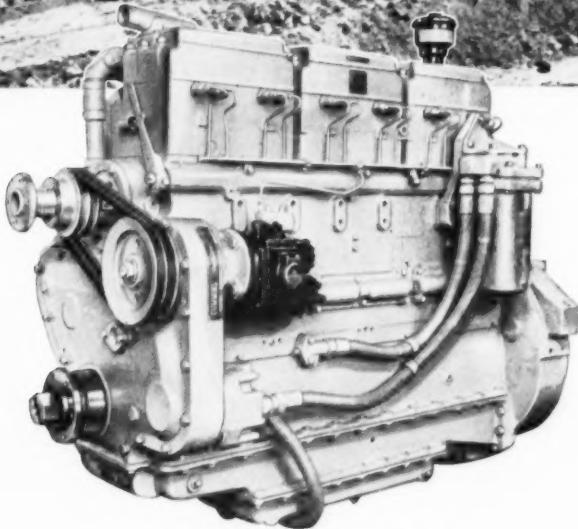
Power-shift with torque-converter

You can power-shift this transmission instantaneously, from one gear range to another, without clutching, synchronizing, or clashing gears. It makes *all* your operators *good* operators. When you move a small speed-selector lever, air-actuated clutches *automatically* operate selected gear-range. At all throttle settings, torque-converter *automatically* proportions speed and power, increases torque for maximum pull on hard work...increases travel speed as less "muscle" is needed. Speed-ranges, with engine turning 2000 rpm, are:

	Forward	Reverse
1st gear	0.0 to 2.2	0.0 to 4.8
2nd gear	0.0 to 5.0	0.0 to 11.0
3rd gear	0.0 to 11.4	
4th gear	0.0 to 26.1	



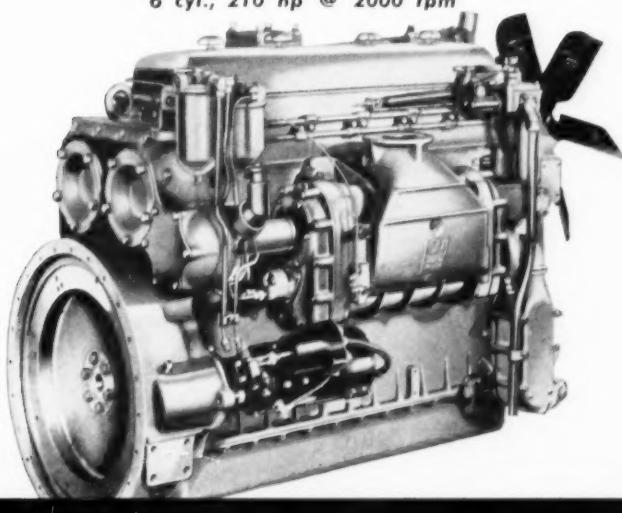
Two C Tournapulls owned by Frank Montgomery, Midland, Texas, carved-out 180' x 225' x 33' deep boat basin in sand and sandrock at Lake Thomas, Texas. "Nothing can compare with Full-pak's loading ability," reports Supt. Stephenson. "As a former operator, I know they'll move more dirt, and move it faster than other scrapers."



CUMMINS Model HB15-600
6 cyl., 200 hp @ 1800 rpm

Your choice:
GM or Cummins engine,
to speed servicing
... cut downtime

GENERAL MOTORS Model 6-71
6 cyl., 210 hp @ 2000 rpm



Y

You may find that the *make* of diesel engine you specify for your self-propelled scraper is important... that a choice can save you hours — maybe days — of production downtime. It may also save considerable maintenance expense. That's why C Tournapull® prime-mover is offered with *your* choice of engine.

For C Fullpak, you may specify either of these field-proven engines... 210 hp General Motors, or 200 hp Cummins. Pick whichever power plant you find better for your particular operation and locale. You can standardize your fleet on one make or the other... improve parts availability while reducing parts inventory. You can pick the engine that your mechanics find easier to service... one that your operators like better... or one that has given you good service in the past.

The choice is yours ... to up-grade fleet operating efficiency, and thereby increase dirtmoving output... to improve your immediate and future profit potential.

Ask for a demonstration ... and see this 18-*yd*. C Fullpak get big, well-packed loads fast... watch it deliver these jumbo payloads on a regular high-speed schedule. Feel free to write or call us at the factory, or to talk it over with the LeTourneau-Westinghouse Distributor in your local area.

*Trademark CP-1539 DC-6

LETOURNEAU-WESTINGHOUSE COMPANY

Peoria, Illinois



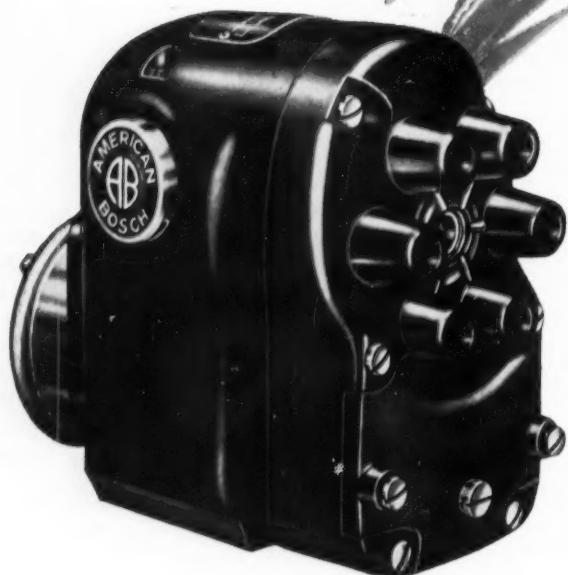
A Subsidiary of Westinghouse Air Brake Company

"Where quality is a habit"

FOR CONSTRUCTION EQUIPMENT·ENGINES • • •

*Better to Start with—
Best in the Long Run!*

**AMERICAN BOSCH
MAGNETOS**



Steadily improved electrical and mechanical characteristics give these famous Magnetos greater power for lightning-fast starts, PLUS the traditional built-in stamina that assures *years* of constant, trouble-free ignition in Construction Equipment engines. This is why these power-packed Magnetos are so steadily used as original equipment by so many leading engine builders.

On all your present equipment you can have this instantaneous spark efficiency and matchless dependability at all engine operating speeds and loads. For, there's an American Bosch Magneto replacement precisely engineered for all spark-ignited engines—in dozers, gas-engine driven compressors, pumps, graders, paving machines and spreaders. Moreover, American Bosch can serve you well at your job-site, through one of the largest and most efficient field service organizations. There's an AB Service Agency near you. Write to us today for Magneto replacement application data on your construction equipment engines. American Bosch, Springfield 7, Mass. A Division of American Bosch Arma Corporation.

AMERICAN BOSCH





Suburban shopping center parking area is "easy rolling" for **BUFFALO - SPRINGFIELD** Standard-Duty Tandems



Above: A Model KT-15AB follows a paver at Indianapolis' Eastgate shopping center. Right: Compacting 2" asphaltic concrete wearing course with an 8-10 ton Buffalo-Springfield Standard-Duty Tandem.



Shumaker Brothers Industries, Inc., contracted to pave the roadways and parking areas for Indianapolis' new 66-acre, \$7,500,000 Eastgate 56-store shopping center.

The paved area of 128,000 sq. yds. required 43,400 tons of stone, 14,080 tons of asphaltic concrete, and 40,000 gallons of MCO liquid asphalt. Total depth of roadways is 10", parking areas 8". For the fast, efficient compaction of the stone base and the 2" asphaltic concrete wearing course, Shumaker relied upon his Buffalo-

Springfield Standard-Duty Tandem Rollers.

Standard Duty Variable-Weight Tandems are available in 5 sizes: 5-8, 6-9, 8-10, 8-12 and 10-14 tons. Outstanding design and construction features include: choice of highly efficient gasoline or diesel power • finest adjustable bevel gear final drive • single power unit assuring precision alignment of final drive, engine and transmission • popular torque converter drive for speeds up to 5.6 mph. • jig-assembled, specially

stressed all-welded frame • compact, low-pressure hydraulic steering • and adjustable, tapered roller bearing yoke and king pin assembly.

Contractors the country over use Buffalo-Springfield Standard-Duty Tandems . . . the finest rollers, for the dollar invested, on the market today. Before you buy, check their job-tested, proven-better features for road roller performance, economy, reliability and efficiency. Ask your Buffalo-Springfield distributor for details, or write for Bulletin S-68-R 157 now!



BUFFALO-SPRINGFIELD ROLLER CO.
DIVISION OF KOEHRING COMPANY • SPRINGFIELD, OHIO



Dump in one second with Dumptor®

On the above operation, Koehring Dumptor drives up to the hopper, body forward. Operator trips the body-release lever, and *gravity* tilts the 6-yard body 70 degrees. One second later the load is out, and Dumptor is on its way back for the next load. Because there is no waiting for slow-acting body hoists, *gravity-dumping* saves 15 to 25 seconds on every round trip. This adds up to a substantial increase in extra yards per hour. For instance — take a typical 1,000-foot haul, where you normally would make 16 trips an hour. By saving an average of 20 seconds dump-time on each trip,

Dumptor gains 320 seconds, or 5.3 minutes more productive haul-time an hour. You get 17½ trips, instead of 16. This, alone, adds 9% to hourly production. What's more, there are no expensive hoist-replacement parts, or hoist maintenance time. *Gravity-dump* never wears out, never balks. You get the same one-second dumping *every time*, under heaviest loads, in all temperature extremes. Better check what this can mean in lower costs, and increased production on your hauling operations. Get the complete Dumptor story from your local Koehring distributor. *Call him today.*



Plenty of power on the haul — You get better than 6 h.p. for every ton of loaded weight when you haul with heavy-duty Dumptor. That's why it accelerates fast, pulls through soft ground, up ramps and grades with less shifting — climbs 24% grades fully loaded. When hauling heavy materials, extra horsepower means extra load-carrying capacity.



No-turn shuttle hauling — Dumptor solves problems of operating in tunnels, along overhead trestles, or narrow haul roads. There is no need to turn, because it travels with equal ease, power and speed in either direction. No-turn hauling offers a big production advantage, too. Every turn saved cuts 15 seconds off cycle time, increases output.



Easy-loading target — Big, 64 square-foot body opening permits loading Dumptor over the side or either end. This saves spotting time, reduces spillage. Heavy duty body is built for rock. Top edge and bottom are box-beam constructed. Sides and ends are rib-reinforced. In fact, Dumptor has a ton of strength for every ton of payload capacity.

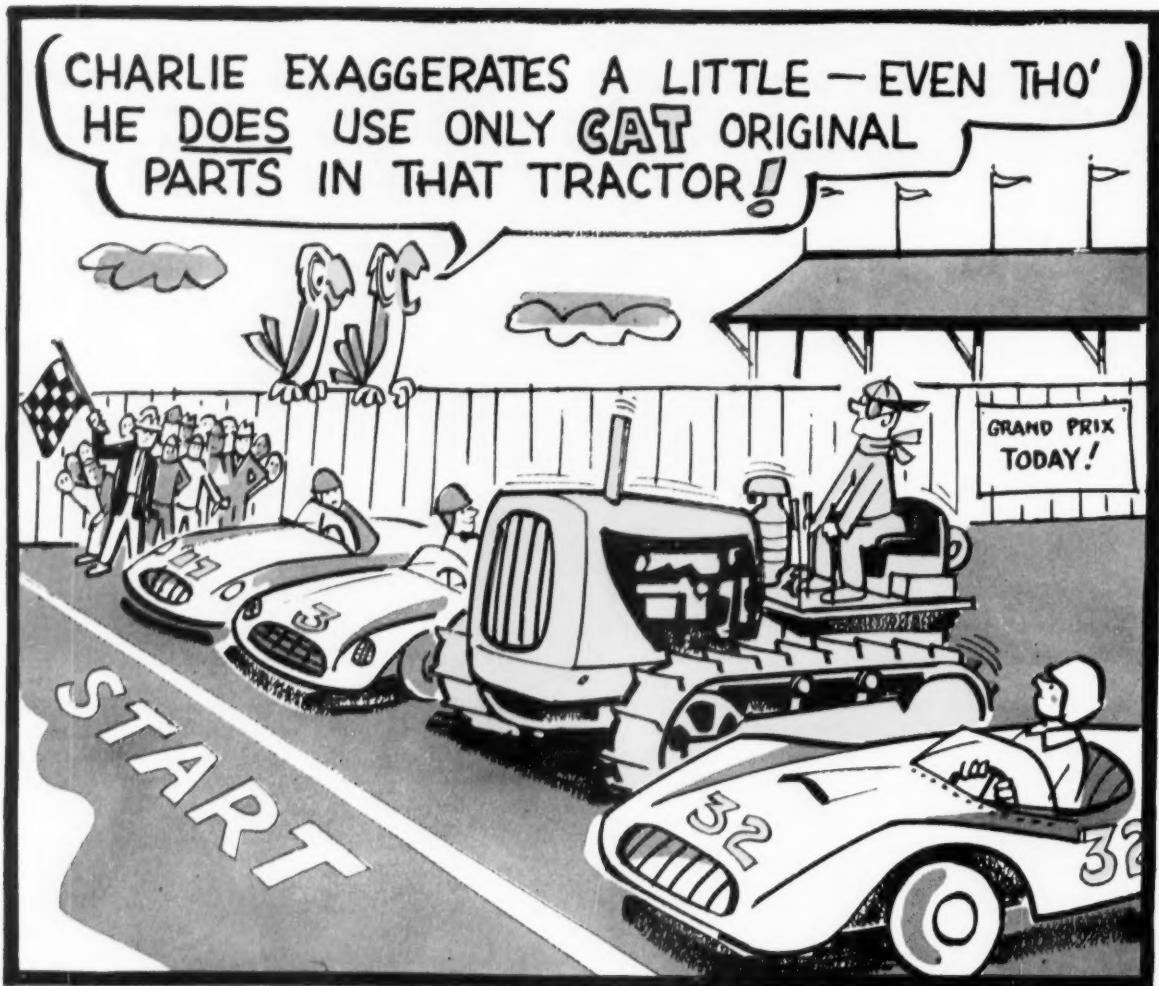


Time-saver on stockpiling — Dumptor puts stockpiling on a fast shuttle-haul basis — eliminates turning on top of pile. Notice how instant dumping action kicks the load out over edge of pile — saves a lot of dozer clean-up. Free-swinging kick-out pan breaks load suction in wet, sticky materials, bolts down to floor when handling rock.

KOEHRING COMPANY, Milwaukee 16, Wis.

Subsidiaries: PARSONS
KWIK-MIX • JOHNSON
KOEHRING-WATEROUS LTD.



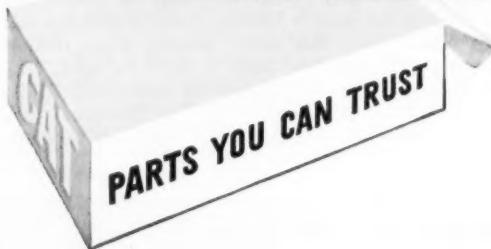


Are they really as much alike as they look? Steel used in industrial standard bolts must withstand 120,000 pounds pull per square inch—CAT* bolts must withstand *at least* 151,000 PSI. Same with other Cat original track parts—higher standards. With "look-alike" track parts, who knows? Be sure to get parts you can trust—from your Caterpillar Dealer. He always has *exactly* the part you need. Call on him anytime.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.



On Massachusetts Turnpike Project...

Gradall averaged 58 hours weekly — from start to finish



Gradall excavated a five-foot deep trench for underground power lines at the rate of 1,000 linear feet daily; then handled backfilling and finish grading.



An 8-foot blade (one of 25 attachments) does a clean, finished job on fill around bridges.



Gradall quickly and economically handled excavation for bridge footers and other structures on the project.



Laying pipe up to 36 inches in diameter was an easy job when Gradall did the work.



At the project's completion stage, Gradall was kept busy spreading top soil and handling finished clean-up operations.



Using a special curb attachment on the Gradall, they unloaded and positioned over 60,000 linear feet of granite curbing.

When L. G. Defelice & Son, Inc., of North Haven, Conn., constructed a three-mile stretch of the recently completed Massachusetts Turnpike, Gradall's versatility and arm-action accuracy were utilized on all phases of the job.

Construction of the main roadbed, ten bridges, three box culverts and two traffic interchanges provided many jobs that their Gradall handled in its stride. Why not put this most versatile of all earth-moving machines on your next highway project and watch both production and profits increase.

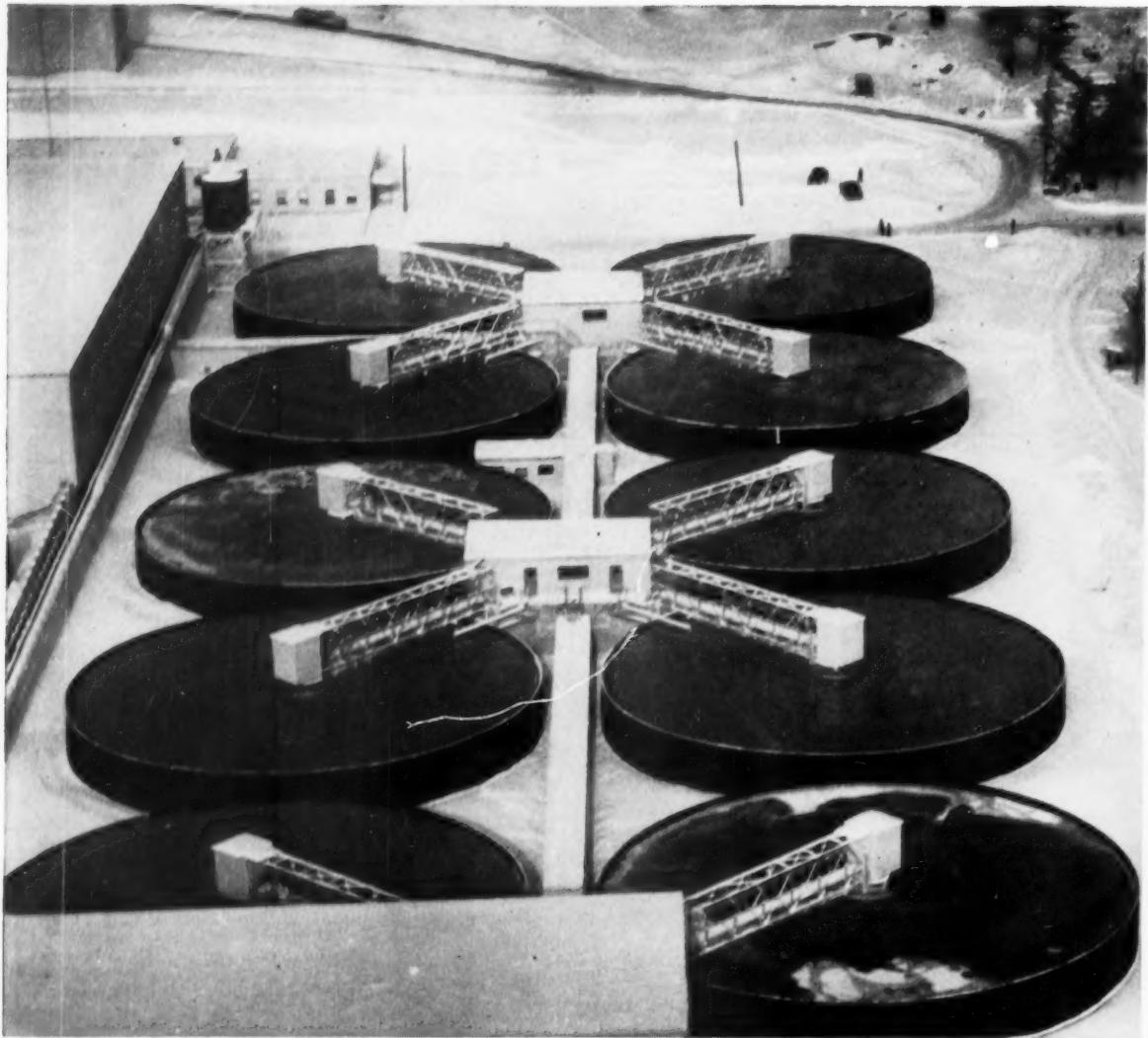
Gradall can cut your costs on all these highway jobs:

- Digging gutter and drainage ditches
- Structure excavations—headwall, stilling basins, etc.
- Trenching for under-drain and large drains
- Placing concrete culvert and drainage pipe
- Backfilling
- Working under bridges and around other structures
- Sloping and grading
- Rip-rapping
- "Hand finish" jobs
- Loading out and spreading top soil
- Pulling concrete forms
- Loading boulders

Gradall®
DIVISION OF
Reg. U.S. Pat. Off.
**WARNER
SWASEY**
Cleveland
CONSTRUCTION
MACHINERY
Div. of Warner

PROVEN BY 11 MILLION HOURS OF DEPENDABLE FIELD OPERATION

B.F.Goodrich report:



Uranium gets an acid bath

B. F. Goodrich improvements in rubber brought extra savings

Problem: Those steel tanks are part of the above-ground operation of the world's largest uranium mines, located in Ontario, Canada. Over 100 huge tanks are used in the process of separating uranium from the ore. But the acids used are so corrosive they would eat holes in the tanks, pipes, fittings and valves.

What was done: B.F.Goodrich engineers recommended rubber lining by the exclusive B.F.Goodrich Vulcalock process. The rubber lining is locked to the metal so strongly and tightly that it practically becomes a part of the metal.

A square inch of it can stand a 500 pound tug without breaking loose. Even if the acid-proof rubber is accidentally punctured, the Vulcalock bond confines the damage to a small area where it can easily be repaired.

Extra benefits: This installation was lined in the field by specially-trained B.F.Goodrich craftsmen. It had to be finished quickly. Working at top speed, they lined over 100 tanks and miles of piping with 9½ acres of rubber.

Why specify B. F. Goodrich: Our tank-lining craftsmen have had a wide variety of experience in rubber-

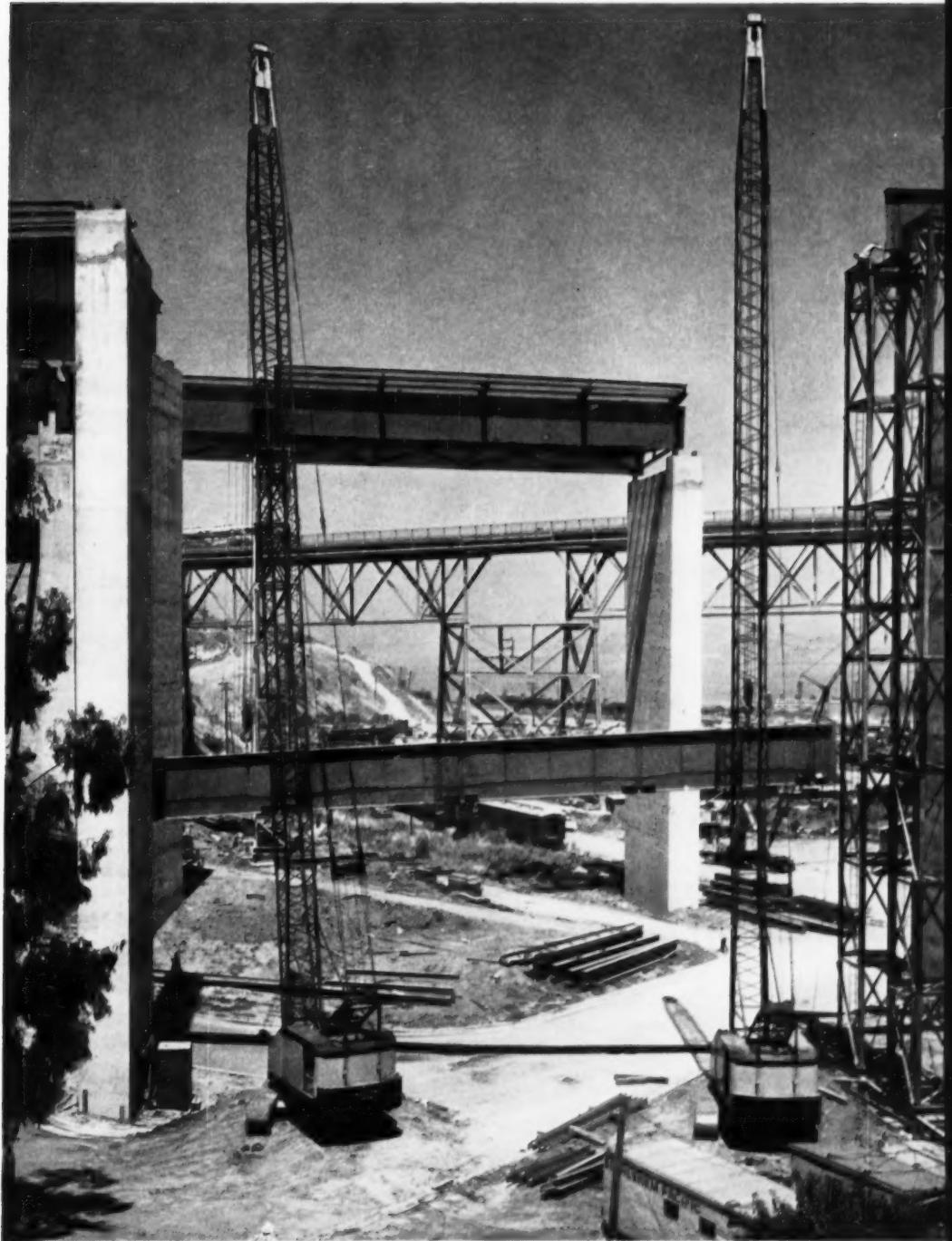
lining equipment in the field. Many of these jobs were big, spectacular; others were smaller, but all were handled efficiently due to the skill and ability gained by years of doing field work under difficult conditions. *B.F.Goodrich Industrial Products Co., Dept. M-168, Akron 18, Ohio, or Tuscaloosa, Alabama.*

B.F.Goodrich
INDUSTRIAL PRODUCTS

Heavy Steel Rides High

•A pair of 50-ton American crawler cranes lift a 22-ton steel girder 120 ft into place on the approach system for the Carquinez Bridge across San Francisco Bay. One crane has 140 ft of boom; the other, 130 ft. Bethlehem Pacific Coast Steel Co. positioned one on a hillside slope graded level and the other on a mound of dirt in the road so that the booms could work at maximum height and minimum radius.

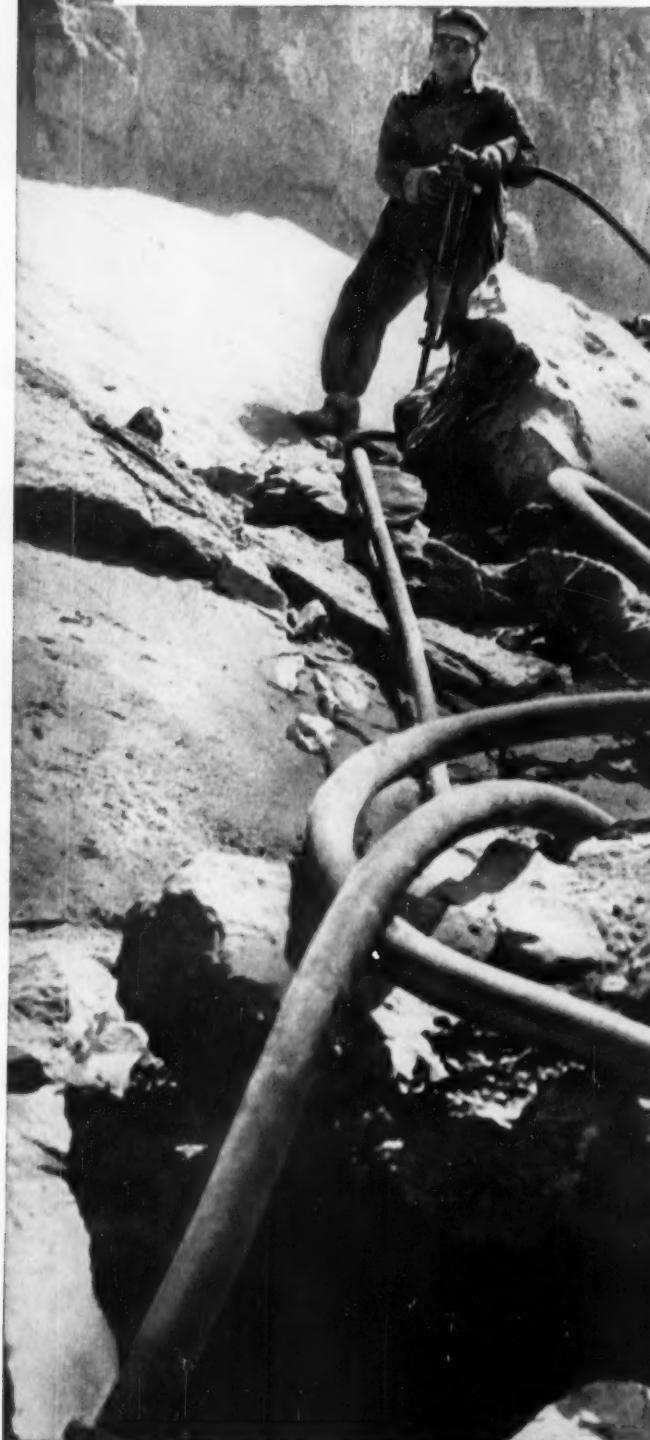
PICTURE
OF THE
MONTH



Users Say



HOSE AND BELTS



Rugged HOMOFLEX HOSE

Homoflex Hose is R/M's exclusive construction for use with air, water, other fluids and gases. Has no pre-set twist . . . coils and uncoils in *any* direction without kinking to eliminate strain, internal damage and hose failure. It's strong enough to stand up under the toughest conditions, yet light and flexible as a rope for easy handling, even in rough and rocky

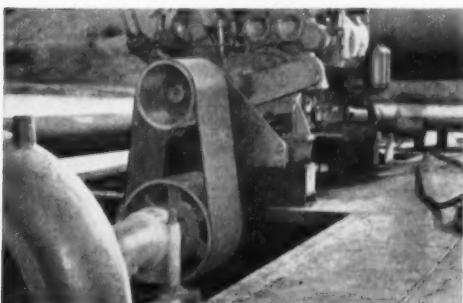
Give You "More Use per Dollar"

... is "Flexible as a Rope"!

conditions. Cover, strength member and tube are virtually inseparable. Uniform inside and outside diameters make Homoflex easier to couple, too.

You get "More Use per Dollar" two ways . . . Easier handling helps workers to get more work done . . . Hose lasts longer.

Write for Bulletin #6879



Eliminate Belt Matching Problems with R/M POLY-V® DRIVE!

R/M's patented Poly-V Drive employs a single, endless V-ribbed belt — eliminating common V-belt matching problems. This new drive delivers up to 50% more horsepower capacity than an ordinary multiple V-drive. Just two cross-sections handle all drive requirements. Lower inventory of belts and sheaves — less maintenance. You get "More Use per Dollar."

Write for Bulletin #6638

For the "Smoothest Running V-Belts Made"
Specify CONDOR or R/M SUPER-POWER V-BELTS

*Poly-V is a registered Raybestos-Manhattan Trademark.



RAY-MAN CONVEYOR BELTS Haul Heavier Loads at Lower Cost

This heavy duty conveyor belt has the easy troughability and wear resistance to handle fuller, heavier loads. Cushioned strength members give resilience to the impact of shock loading . . . and flexibility to train naturally. Balanced double compensation construction relieves outer ply stress, prolongs belt life. Ray-Man Conveyor Belt resists gouging and ripping . . . holds fasteners much better than other types of belts . . . requires no breaker fabric. Like all Raybestos-Manhattan heavy duty belts, Ray-Man is moisture resistant and mildew-proof . . . and features the exclusive "XDC" Cover which greatly increases protection against wear, tear, cuts and abrasion . . . You get longer, trouble-free service . . . "More Use per Dollar."

Check also R/M's extra-cushioned Homocord belt for unusually abusive shock loading . . . and R/M Tension-Master for extra long lifts, high tensions.

Write for Bulletin #6915

RM 708

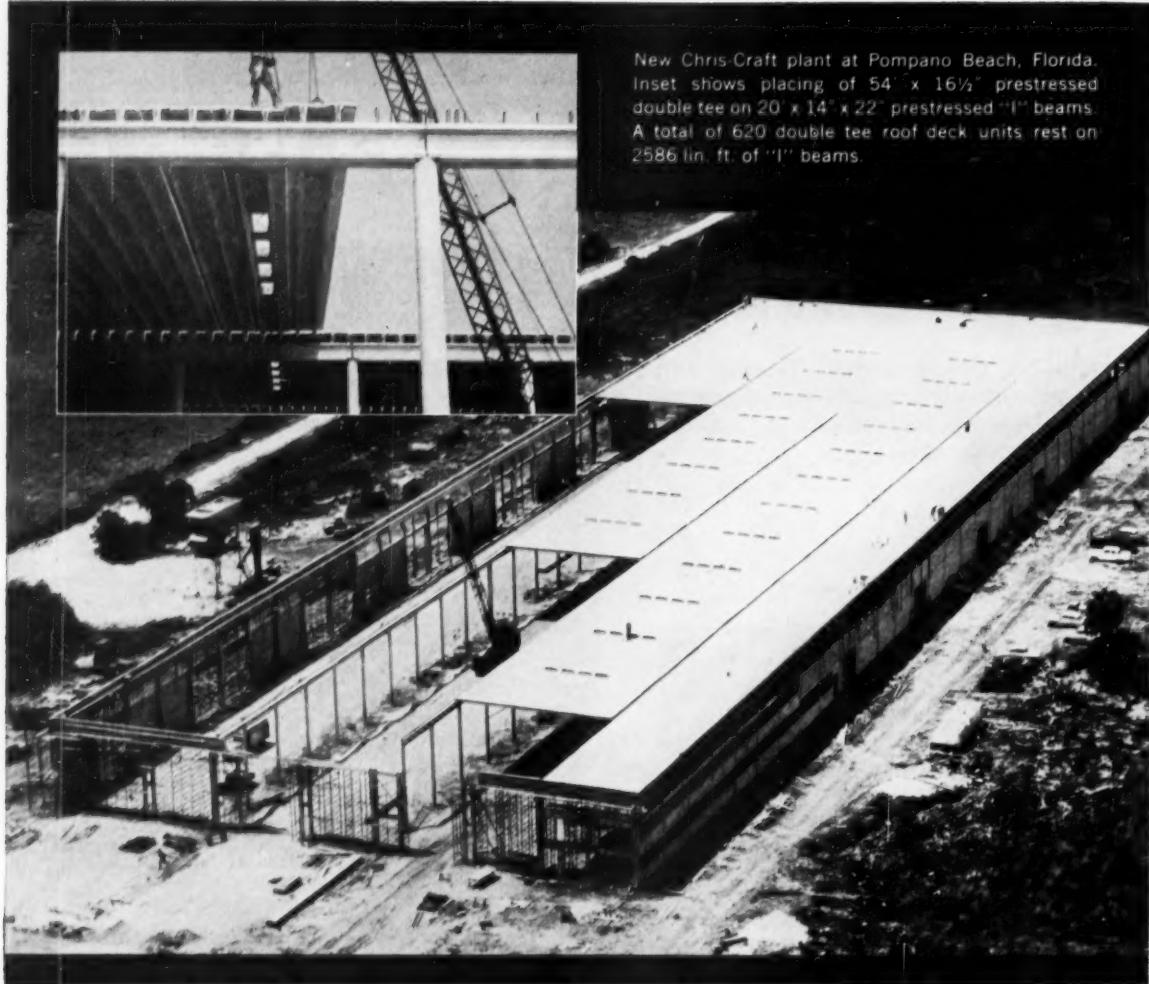
BELTS • HOSE • ROLL COVERING • TANK LININGS • INDUSTRIAL RUBBER SPECIALTIES

MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products: Abrasive and Diamond Wheels • Brake Blocks and Linings • Clutch Facings • Asbestos Textiles • Mechanical Packings • Engineered Plastics • Sintered Metal Products • Industrial Adhesives • Laundry Pads and Covers • Bowling Balls





New Chris-Craft plant at Pompano Beach, Florida. Inset shows placing of 54" x 16½" prestressed double tee on 20" x 14" x 22" prestressed "I" beams. A total of 620 double tee roof deck units rest on 2586 lin. ft. of "I" beams.

120,688 sq. ft. of prestressed roof deck placed in 9 working days

It took only 9 working days for a 5-man crew using a 20-ton crane to place the double tees for this 623' x 194' roof deck. Fast, economical results like this are one of the big reasons for the rapidly growing use of prestressed concrete.

For matching speed and economy in precasting the units for this job, Lewis Manufacturing Company used LEHIGH EARLY STRENGTH CEMENT. "Our entire operation," writes Mr. Lewis, "has always been geared to the use of Lehigh Early Strength Cement and live steam curing. This fast, economical production method enables us to give our customers better service, at lower cost."

This job is a typical example of the advantages of both prestressed concrete and Lehigh Early Strength Cement in modern construction.

Contractor: Witters Construction Co., Hialeah, Florida

Prestressed Units Manufactured and Erected By: Lewis Manufacturing Company, Miami, Florida

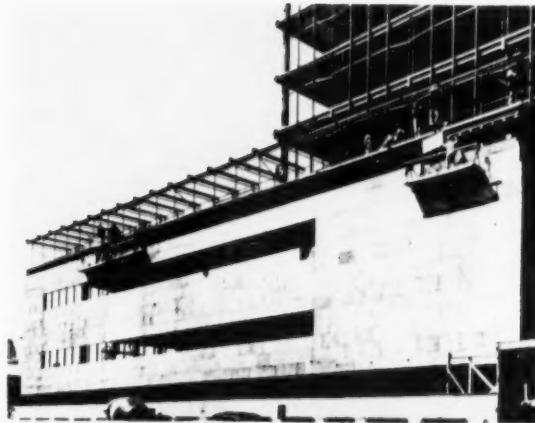
- LEHIGH EARLY STRENGTH CEMENT
- LEHIGH MORTAR CEMENT
- LEHIGH PORTLAND CEMENT
- LEHIGH AIR-ENTRAINING CEMENT



LEHIGH PORTLAND CEMENT COMPANY

Allentown, Pa.

Construction News in Pictures . . .



Placing Wall Panels

Workers on swinging scaffold hung from monorail place precast wall panels for the National Bank of Commerce in San Antonio, Tex. An electric winch on the monorail hoists the panels. Monorail is clamped to outrigger I-beams on Patent scaffolds. General contractor is Henry C. Beck. Winn-Lee Masonry Co. is mason contractor.



Turnpike Bridge

Erection crews of Bethlehem Steel Co. hoist main girder sections for the center span of the 3,769-ft Quinnipiac River Bridge on the Connecticut Turnpike. Traveler with 115-ton capacity lifts each main girder section in two pieces, top and bottom, each approximately 120 ft long. Assembled sections range from 13 to 22 ft deep.



Rocky Trench

Multiple pneumatic drills mounted on side-boom tractors punch blast holes in rocky bottom of ditch for a pipeline that will carry crude oil from new fields in southeastern Utah to refineries near Los Angeles, Calif. The 16-in. pipe will lie in a ditch about 5 ft deep. Shell Pipe Line Corp. is building the 650-mi pipeline across the desert.

continued on next page



A Lot of Boom

Erecting structural steel for a new guided missile plant of The Martin Co. near Littleton, Colo., requires high lifts that average approximately 1,500 lb. The contractor, Shurtleff & Andrews Co. of Salt Lake City, Utah, rigged a 60-ton Manitowoc 3900 crane with 170 ft of boom to set the high steel for the missile assembly building.



Precast Holes

Tin cans nailed to the forms make it easy to drill holes for pipe and conduit through the 10-in. second floor slab of the Varian Associates plant in Palo Alto, Calif. Anderson & Rowe, Inc., of San Francisco carefully positioned the 8-in. high cans by measurement. After the pour, a diamond drill cut through the top 2 in. of the slab.



Riding on Landing Gear

To move this 400-ton dredge 18 mi across Southern California desert roads Western Dredging and Construction Co. rigged an undercarriage composed principally of landing gear and wheels from B-29 bombers. With four wheels on each side and two wheels in front, three tractors hauled the dredge to its new work site over highways.

this is the **TS-360**

15 yd struck
20 yd heaped
280 horsepower



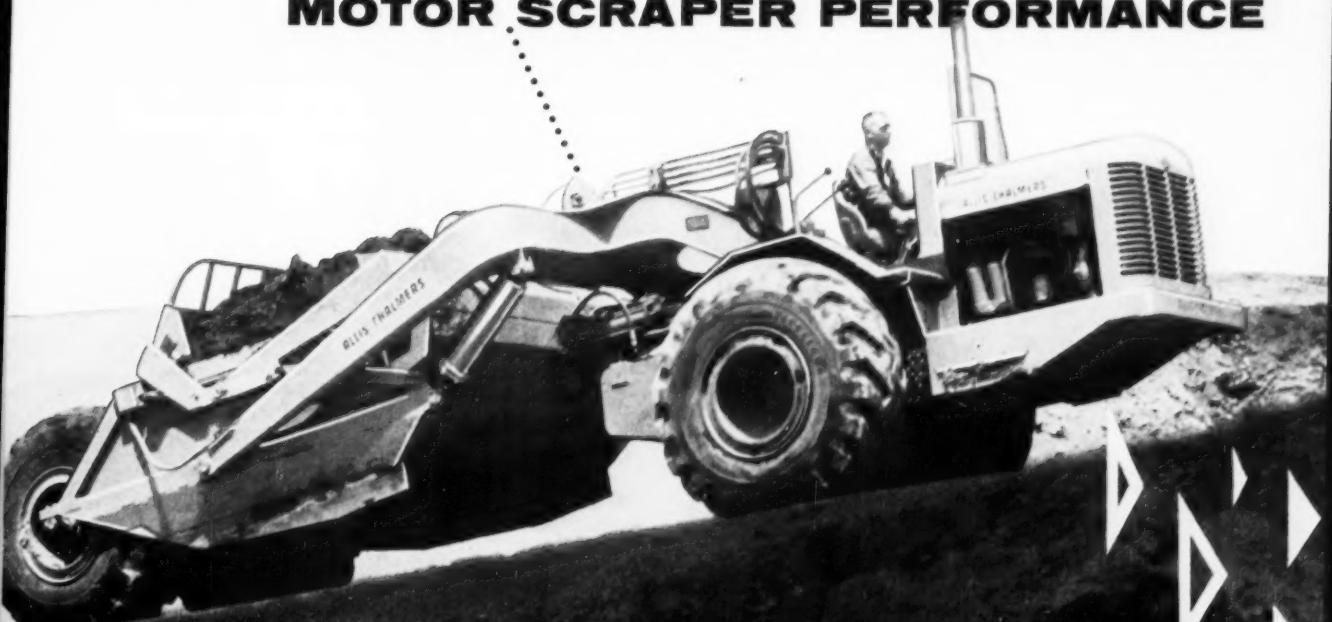
this is the **TS-260**

11 yd struck
14 yd heaped
200 horsepower



now...

ALLIS-CHALMERS
BRINGS YOU ANOTHER
NEW MEASURE OF
MOTOR SCRAPER PERFORMANCE



the TS-160

NEW Allis-Chalmers TS-160

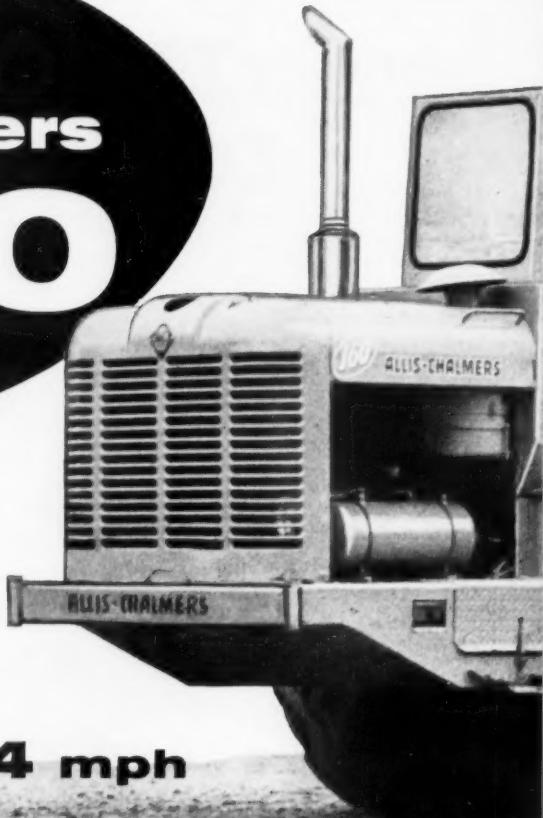
7 yd struck

9.5 yd heaped

155 horsepower

5 speeds to 25.4 mph

12-ton payload



Measure these advantages for

22 hp per struck yard—Big Allis-Chalmers supercharged diesel engine delivers extra lugging ability for tough pulls, fast loading. Versatile TS-160 can team up with big equipment or work alone on long- or short-haul construction jobs—handle a wide range of utility jobs, travel at speeds up to 25.4 mph.



Measure these features . . . Allis-Chalmers 516-cu-in. diesel engine—dependable power at all working speeds • Independent, constant live hydraulic power for steering and scraper operation • Low, wide bowl—8-ft, 1½-in. cutting edge . . . 3-piece, interchangeable cutting edges . . . double-acting hydraulic bowl lift jacks • Positive hydraulic ejection, high apron lift to full 7-ft, 1½-in. opening • Roomy operator's compartment, easy-to-reach controls, 24-volt direct electric starting, adjustable bucket-type seat, synchronized 4-wheel air brakes • Big push block for all types of pushers—positioned for in-line push • Full-circle visibility while loading, spreading and traveling . . . operating ease under all conditions • 17¼-in. minimum ground clearance in hauling position.



a wide range of construction jobs . . .

Turns non-stop in less than 25 ft with 90-degree hydraulic steering . . . easy maneuverability in narrow cuts, faster cycles without reversing in tight turn-arounds.



FULL 90° STEERING

Moves quickly from job to job . . . when required, transport wheels are available to meet legal load limits for highway travel.



Allis-Chalmers, Construction Machinery Division
Milwaukee 1, Wisconsin

ALLIS-CHALMERS

Engineering in Action

GENTLEMEN: Have the Allis-Chalmers Construction Machinery dealer serving my area arrange a demonstration of the TS-160 motor scraper for me .

Name _____

Address _____

City _____

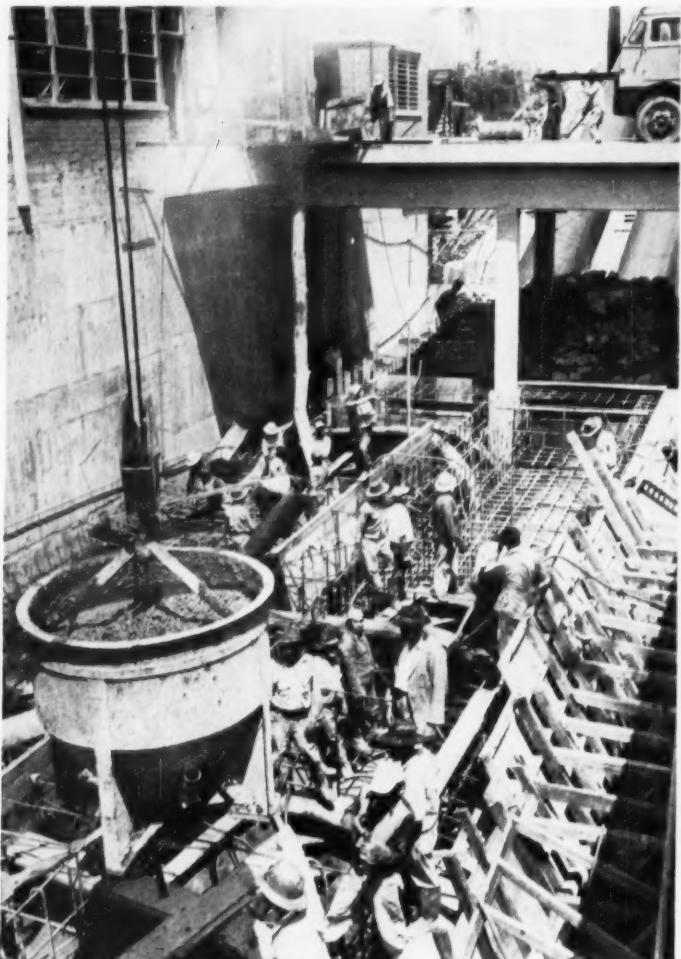
State _____

Type of work _____

Construction 'Round the World ...

In Columbia

Workmen pour concrete for the powerhouse of the \$13.5-million Laguneta Hydroelectric Project near Bogota. Two penstock tubes and a concrete-lined tunnel will carry water nearly 2 mi from the Bogota River to three generating units with a total capacity of 54,000 kw. Gilbert Associates and Frederick Snare Corp. of New York are engineers and contractor.



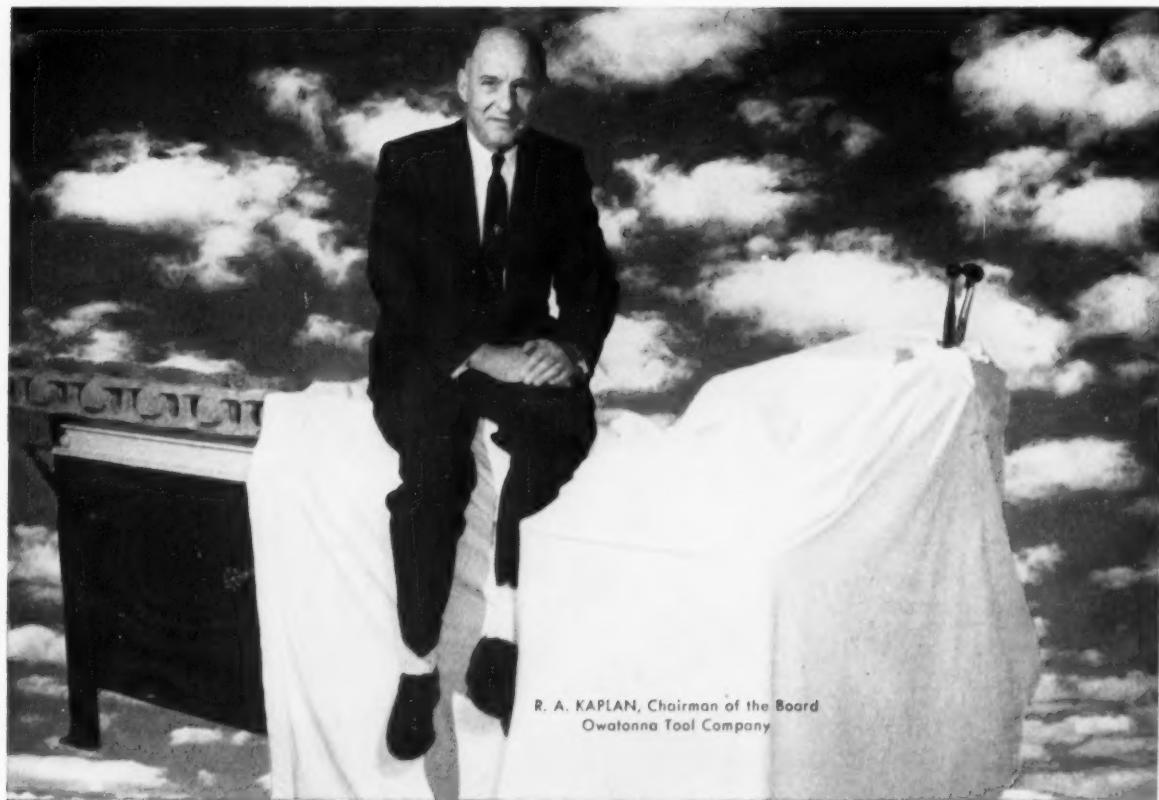
In India

At the site of the \$34-million Gange Bridge, the Ganges River is $2\frac{1}{2}$ mi wide. A fill 40 ft high constructed from a trestle will block the north channel of the river; a bridge consisting of 14 spans of 403 ft and four shorter approach spans will cross the south channel. Main trusses of the long bridge will be 60 ft deep. Completion is due in 1959.



In The Netherlands

Steel arch bridge and a double bascule bridge form part of a new 5-mi crossing from Schellingwoude to Amsterdam. Approximately 3 mi of the crossing consists of structures. A casting yard at the site turns out prestressed bridge components. The project, under construction for two years, is scheduled for completion this year.



R. A. KAPLAN, Chairman of the Board
Owatonna Tool Company

"Our new OTC track pin press is the most revolutionary advance in the past 20 years"

"We talked right to the men who use and service heavy construction equipment. We found out what they needed . . . and wanted. Then we designed this new OTC track pin press . . . a brand-new design based on an entirely new principle.

"This isn't a 'beefed up' small press. Instead, it's new from the ground up . . . specifically designed to handle the heaviest and biggest tracks now in use . . . or even contemplated.

"Right now I can't tell you the details about this new press, but I can say it's far faster, safer and easier to operate than any track pin press ever built! . . . and

that includes our other OTC presses. In actual tests with this press we've taken a track down to pins, bushings and sidelinks almost twice as fast as it's ever been done before . . . no matter how rusted or 'frozen' the parts!

"Our official announcement is still a few weeks off, but I want to give you a hint of what's coming. Take it from me — this new press is well worth waiting for. Don't buy any press until you see the new OTC track pin press in action.

"Fill in the coupon below and send it to me today. I'll see that you get complete information just as soon as it's available."



MAIL THIS COUPON NOW!

OWATONNA TOOL COMPANY

380 Cedar Street Owatonna, Minnesota
World's Leading Manufacturer of
Hydraulic Maintenance Tools



MR. REUBEN A. KAPLAN, Owatonna, Minn.
O.K., Rube — Put me down for advance
information on the NEW OTC TRACK
PIN PRESS.

NAME _____

FIRM _____

ADDRESS _____

CITY _____ STATE _____

I have a track pin press now YES NO



*Job: remove 1,000,000 cobblestones
plus 30,000 square feet of concrete*

Loading costs threaten profits until N.Y. firm buys this 2 $\frac{3}{4}$ yd Michigan

Due to extremely rigid job specifications and unusually tough material, Triboro Asphalt Company, Flushing, New York, faced a substantial loading problem in stripping 31 blocks of six-lane Third Avenue in Manhattan. Recognizing the advantages of a single machine with speed and power to keep costs from getting out of hand, they asked NYC distributor United Tractor & Equipment Corporation to demonstrate a 2 $\frac{3}{4}$ yd Michigan Tractor Shovel. When they saw, they bought!

Replaces big crawler

The 24 mph Michigan replaced a 3 yard crawler loader. "The crawler was too slow . . . too often blocking traffic . . . and it couldn't get big enough loads to maintain the desired production pace," according to Supt James Magnotta. Smaller crawlers, attempting to load heavy granite-slab

cobblestones, tore out final drives and ended up in the shop. Two big rubber-tire loaders, which had a crack at the job, were sent back to the yard. "They didn't have either the power or the traction needed," said Supt Magnotta.

Does job in 27 days

So the Michigan, working alone, piled and truck-loaded *all the cobblestones*. Over a million of them were handled, according to engineers. Each measured about 8 x 12 inches, weighed about 15 lbs. Individual bucket loads averaged 250 blocks each . . . 3,750 lbs. *The entire job was done in 27 eight-hour days . . . far faster than other stripping contractors doing the same kind of work with power shovels and crawler-loaders elsewhere along Third Avenue.* "Far better too," adds Magnotta. "Our Michigan left the sub-base clean after only one pass. Sensitive controls let the operator

(Advertisement)



Six-inch concrete slab breaks quickly as Michigan applies its tremendous breakout action. Fast work by the Michigan made job much safer for maintenance of normal highway traffic.

keep just enough down-pressure on the bucket. All we had to do before laying asphalt was fill and level a few spots."

Breaks out concrete

After several days, the Michigan operator became so enthusiastic about the power of his machine, the street foreman tried to tame him down. He gave orders to break out and load some concrete pipe-vault roofs. Even this tough problem had a simple solution. By working bucket edge under the vault and using Michigan's terrific breakout, operator easily broke it loose. Concrete patches and driveway extensions, some 15 to 50 square feet, proved just as easy. "I put in some terrific days—running around the job like a pickup truck," says the operator, Fred Cerbone . . . "did a tremendous amount of work—yet I was *less tired* at the end of a day than on anything else I've operated in my 25 years with Triboro."

How to cut costs

Triboro's Michigan did more than boost operator satisfaction. It helped cut many dollars of expense from the multi-thousand dollar paving project! As every contractor knows, bidding is extremely competitive on this kind of job; by handling loading and clean-up efficiently, the Michigan kept these expense items from eating profits.

With Clark torque converter, power-shift transmission, power steer, and planetary-wheel axles standard on all models, Michigans deliver more usable power, traction, and speed than any other machines of their type. If you're willing to be convinced Michigan is in a class by itself, do what Triboro did: *ask for a demonstration*. You name the job!



Single Michigan pass leaves sub-base clean, smooth, ready for repaving. Note how unobstructed bucket-arm design preserves dumping clearance.

Michigan is a registered trademark of

CLARK
EQUIPMENT

CLARK EQUIPMENT COMPANY
Construction Machinery Division
2403 Pipestone Road
Benton Harbor 44, Michigan
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YOUR PROFITS GROW WITH THE TX4

*The plant that grows
with you . . .*



The World's Most Portable Plant

The bin section of the TX4 is crane lifted and shipped in one piece. The batchers are in one unit with bracing all in place. No tie-downs or support needed for moving. All wiring and air piping are self-contained ready with quick-connectors for fast "plug-in" hook-up. Support columns ship separately and are hinged to bin, swing into place when crane lifts bin. Bolts are very few in number—all are large and easily handled. Bin rests on foam rubber cushion at top of batcher section, provides a tight, dust and cement proof seal when compressed by two hand-clamps which hold both sections securely. . . Dismantling and re-erection are but a matter of hours instead of days.

Whether you operate 1, 2, 3, or 4 pavers — there's a BUTLER TX-4 Roadbuilders set-up for you. And as you grow — the same basic plant grows with you. No old equipment to replace . . . you simply add two bins and one batcher to expand a 1 or 2-paver plant to a set-up for 3 pavers. And for 4 pavers you add only one batcher to each of the four bins. Low investment and the highest batching speed the roadbuilding industry has ever known.

And all with only one operator — even the 4 paver set-up. Batching is completely automatic and interlocked. Operation is simultaneous or in sequence. A switch selects topping or base material as required. In short, the TX-4 meets every batching condition — every problem.

The Butler TX4 obsoletes all previous equipment ever built. Read the complete description offered in this new Bulletin. Every part, every component completely illustrated. Send for it today. Just write "TX4" and your address on a postcard.

BUTLER BIN COMPANY

949 BLACKSTONE AVE. • WAUKEEHA, WISCONSIN



Analyzing his Michigan Tractor Dozer, Sanders Construction Corporation president says "it will pull as much as a 14 ton crawler, yet is much faster between jobs, much cheaper to maintain."

Here the 165 hp rubber-tire rig

STARTS, SKIDS 60,000 lb LOAD

Under contract for the \$20,000,000 Cousin's Island steam electric generating station at Yarmouth, Maine, Sanders Construction Corporation, Portland, went to work facing a typical Maine winter. Despite cold weather and heavy snow, they completed the job on schedule—and at a nice profit. Prominent in their successful operation was a single piece of extremely versatile equipment—a Michigan Model 180 Tractor Dozer.

Tows 55 tons up snow-slick grade

This rubber-tire unit did a wide variety of pulling, pushing, and lifting jobs. It once hauled a 43 ton set tank on a 12 ton trailer *upgrade* . . . and did the job with several inches of snow on the ground—and more falling. It regularly skidded 10 to 30 tons of sled-loaded structural steel (illustrated).

Footing on this assignment was often abrasive gravel or sand . . . much of the way uphill . . . but at no time did the four-wheel-drive Michigan have trouble starting or skidding the big loads. It also skidded sleds of 12 inch cast iron pipe . . . pulled machinery . . . graded and, with its low-pressure tires, compacted the area for landscaping.

Will do almost any job

"On the basis of performance, we feel there's hardly anything a Michigan Tractor Dozer won't do," says Mr. Sanders. "Of course, there are a few soil conditions in which it—and any other machines on rubber—just won't work. But anywhere rubber *will* work—and that's most of the time—we'll take the Michigan over ANY crawler-dozer in its size class (14 tons)! It does most jobs a lot faster. It moves around faster (up to 27 mph). Its maintenance costs

are lower. Operators like its power shift and power steer. And we like its price . . . about \$6,500 less than other big rubber-tire dozers."

We of Clark Equipment Company think you will like its price—and performance—too. Ask your local Michigan Distributor for full details—or write us for specs and case history proof.

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CONTRACTORS! There's a lot of useless back-breaking digging involved in uncovering new construction business . . . unless you have someone breaking ground for you . . .



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Trying to uncover new construction business by looking everywhere is the costly way to get the jobs you want. The best, most economical method is to let Dodge Reports pin-point exactly the kind of construction activity you're looking for right in the area you serve. If you'd like to see how this timely, accurate daily report service can get you more and better business, just read, then mail this coupon today.

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Yes! I'd like to see how to get more business by knowing in advance who's going to build, what, when, where.

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I'm interested in General Building House Construction Engineering (Heavy Construction)

In the Following Area: _____

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Twenty five ton lifting capacity!
Handles easily . . . fast on the highway . . . and
**STRIPS QUICKLY, EASILY TO MEET
HIGHWAY WEIGHT LIMITATIONS**



"*These* are the four main reasons we bought our new 25-ton Michigan Truck Crane," says Pete Smith, Secretary of Emmerson Truck & Storage Company, Battle Creek, Michigan . . . "and the four main reasons we like it so much today. Results of the past eight months of work certainly justify our selection!"

**Reaches for the sky—or
into a building**

Photo illustrates one of the "results." Here, with 85 ft boom and 15 ft jib, Emmerson lowered an old 2½-ton (8' high, 3' wide) commercial blower from the roof of Kellogg's Battle Creek plant. Entire assignment took just a few hours, including time for the Michigan Crane to drive 3 miles through town to the world-famous cereal factory and time to transport the blower to Kellogg's yard several blocks away. *Cramped quarters*, on the other hand, have proved equally accessible. With a very short boom-end (made in the Emmerson shop) to reduce boom length to 17 ft, the Michigan sets machinery *inside* plant buildings. Negotiating doors as small as 8½ ft wide by 12 ft high, the Michigan drives right in where many 25-ton cranes can't go.

**Handles 3-ton horizontal
lifts in muck**

Another "toughie" the Michigan took in stride was the laying of new 12" gas main under a new river channel. Here, the boom was used *absolutely horizontal*—45 feet out—while the Michigan maneuvered 3-ton pipe sections into place. Biggest load lifted to date was a 25-ton press. Highest loads have been 5,000 lb buckets of concrete—100 feet up! Some of the hardest have been in ankle-deep mud . . . setting huge roof joists, for example. Even at night, with boom flood-lit by portable chassis-mounted generator, Emmerson has set transformers and regulators for Consumers Power & Light Co.

**"Performs beyond expectations;
not one complaint!" — President**

"We're very pleased with our Model T-24 Truck Crane," says Bob Sergeant, President and General Manager of Emmerson. "It's performed beyond our expectations; we haven't one complaint. This Michigan has done everything the manufacturer said it would—and more!"

Why don't YOU look into the advantages of a Michigan Truck Crane? Write for new illustrated booklet on the Model T-24 25 Ton Truck Crane. Get the facts, today!

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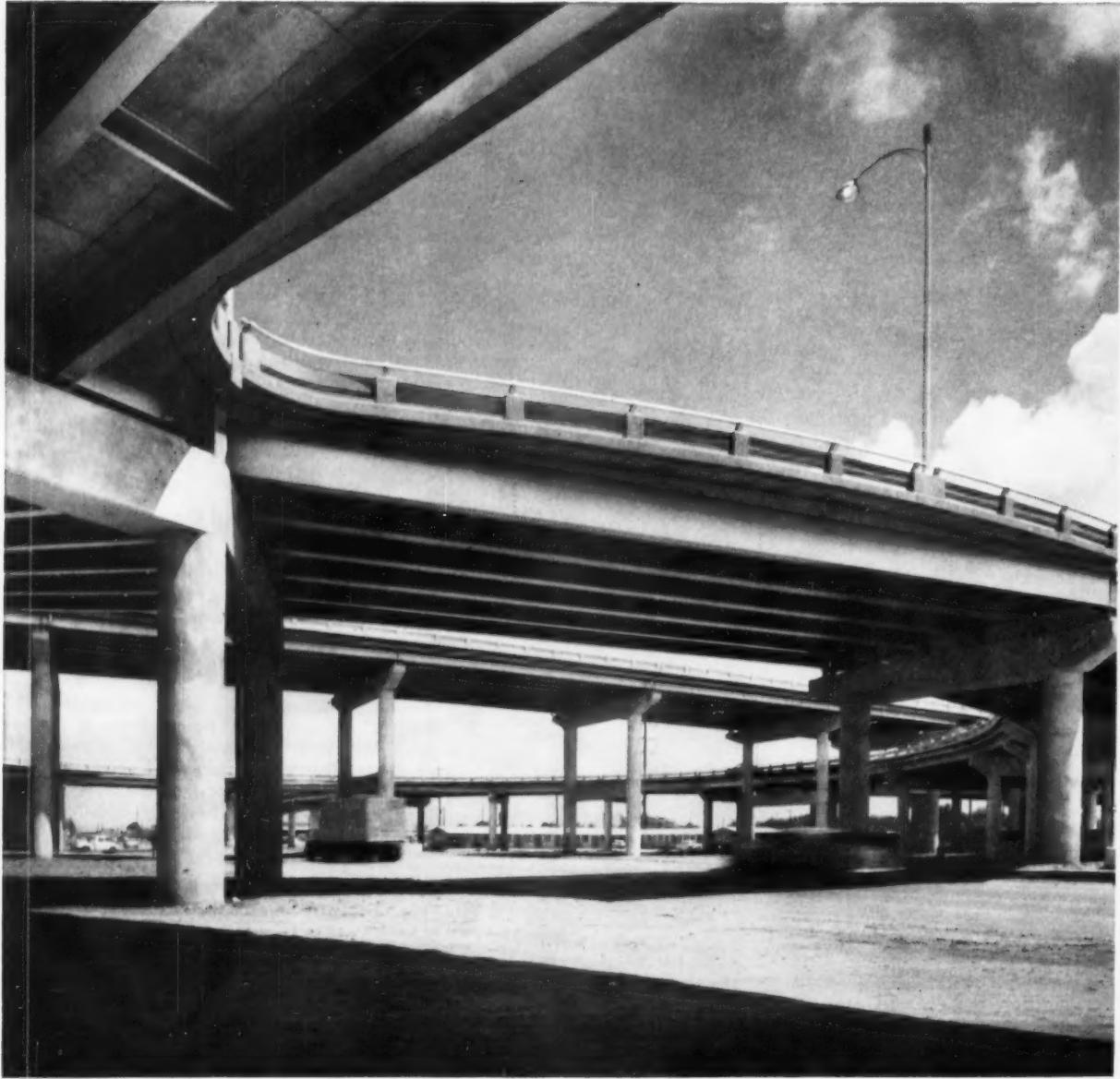
Benton Harbor 38, Michigan

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**CLARK®
EQUIPMENT**

New highway interchange demonstrates **Three
of fir plywood**



Fir plywood helped cut costs and achieve smooth concrete on this just completed New Orleans interchange.

key advantages concrete forms

1. smooth concrete surfaces

Because fir plywood had proved superior on previous jobs, it was again specified for this new 3,800 foot interchange on the Airline Highway, New Orleans. The contractors report: "It gives the smooth surface that inspectors like to see."

2. economy through re-use

The $\frac{5}{8}$ " and $\frac{3}{4}$ " panels of Exterior PlyForm used on the job gave an average of 30 re-uses. Less than 100,000 square feet of Exterior PlyForm was required for all form work on beams and roadbed of the four-lane structure.

3. time and labor savings

Job Superintendent Don Ducote says this about PlyForm: "I'm well satisfied with it. It's faster and more economical—and safer. It covers 32 sq. ft. at once, and that's a lot of area to walk on when you're up in the air." Other advantages cited: tightness, no leakage of concrete.



ALWAYS SPECIFY BY DFPA GRADE - TRADEMARKS

INTERIOR PLYFORM®—standard concrete form grade made with moisture-resistant glue. Gives multiple (10-12) re-uses.

EXTERIOR PLYFORM®—standard form grade made with waterproof glue. Gives maximum (25 or more) re-uses.

OVERLAID FIR PLYWOOD—special panel with hard, glossy fused resin-fiber surfaces. Waterproof glue. Up to 200 re-uses.

FOR YOUR FILES: Complete application-specification-design portfolio assembly. Write (USA Only) Douglas Fir Plywood Association, Tacoma 2, Washington, Dept. 136.

AIRLINE INTERCHANGE

LOCATION: New Orleans, Louisiana

CONSULTING ENGINEERS

AND ARCHITECTS: Palmer & Baker

CONTRACTOR: Louisiana Paving Co.



Laying Exterior PlyForm for the overpass roadbed. Big 4x8 foot panels speed work, give tight form construction that prevents leakage and provides smoother concrete surfaces.



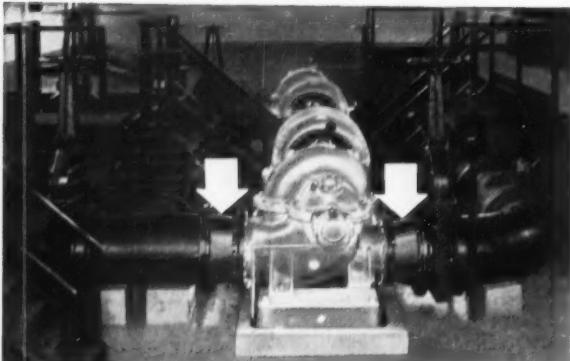
Pouring for one of the supporting beams. Fir plywood is ideal for form work of this kind; panels are light, easy to handle and move. Plywood forms require less bracing and backing, cut construction time.



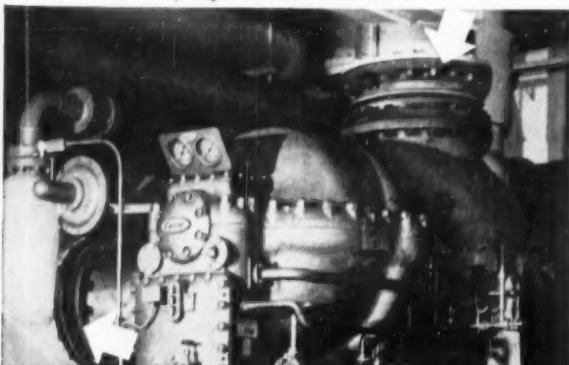


EXPANSION JOINTS

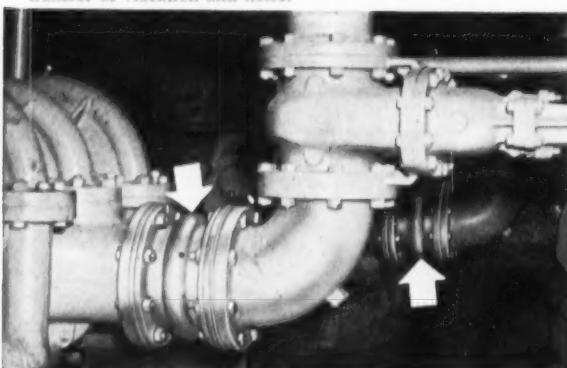
Expanding the Designer's Scope



The flexible rubber expansion joints on the centrifugal pump installations (above) are made by U. S. Rubber. They prevent stresses caused by expansion and contraction.



This compressor has U. S. Expansion Joints on the suction and discharge lines. Like all U. S. Joints, these insulate against the transfer of vibration and noise.



Piping equipped with U. S. Expansion Joint to compensate for any misalignment caused by load stresses, wearing of parts or settling of building.

U. S. Rubber Expansion Joints are resilient and therefore do not, like metal, set permanently when compressed. Constant flexing merely keeps them alive... prevents brittleness.

- They absorb both axial and lateral deflection far more than metal joints. Greater insulation against vibration and pump noises. No electrolysis, corrosion or erosion.
- Handle pressures from 40 lbs. to 125 lbs.
- The outside diameter of the arch is smaller than on metal joints. (Face-to-face dimensions, even with multiple arches, are smaller.)
- Weight is much less. This, plus the fact that no gasket is needed between flanges (metal joints require gaskets) results in an easier installation lowering the cost.

"U. S." was the *first* to develop expansion joints. They are at work in every kind of industry, prolonging the life of equipment in pressure or vacuum pipe systems. Some are still in service, after 30 years of operation. Obtainable at any of the 28 "U. S." District Sales Offices, or write us at Rockefeller Center, New York 20, N. Y. In Canada, Dominion Rubber Co., Ltd.



For the complete technical information catalogue on the entire line of U. S. Rubber Expansion Joints, contact your nearest "U. S." District Sales Office or write us at Rockefeller Center, New York 20, New York.



Mechanical Goods Division

United States Rubber

Don't Sell Highways Short

"WHAT'S WRONG with the highway program? From many quarters this question is being bandied about as though roadbuilding was coming to a halt, and grass was about to sprout in the streets. Well the answer is, "Very little." Highway contract awards are way up, and a continued climb is forecast.

Unfortunately, certain unfavorable aspects have been magnified and kept alive so that something like pessimism exists in some areas. Roadbuilding, slowed by a wet spring and the cement strike, is now booming. And right-of-way procurement scandals, while shocking in themselves, are certainly more the exception than the rule.

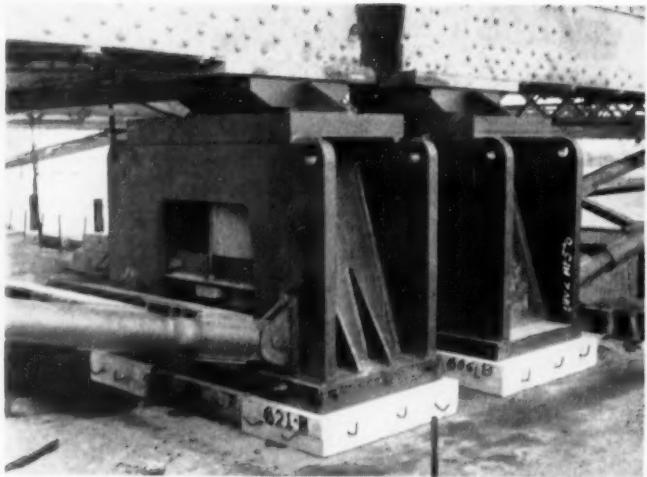
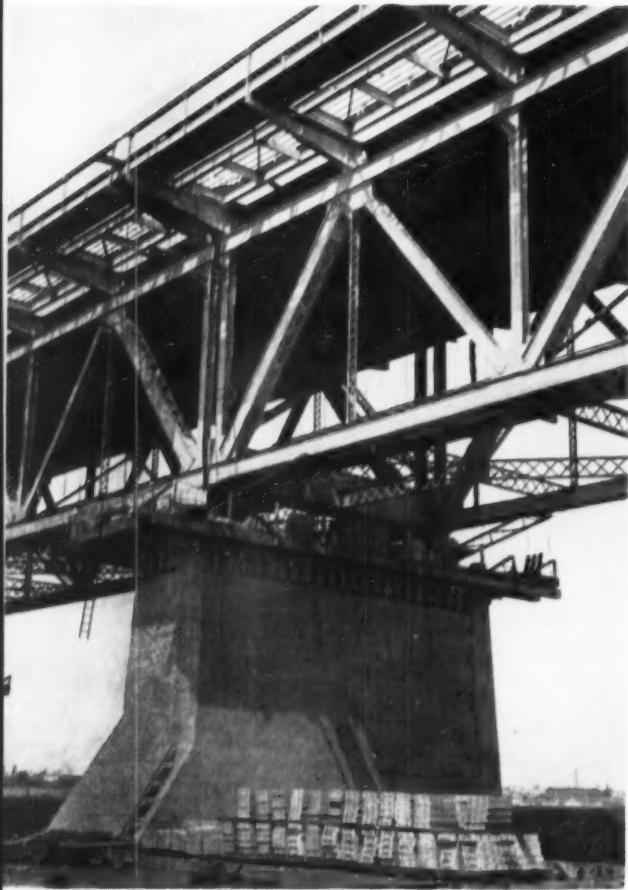
Why then the feeling of gloom? One of the main reasons seems to be that those who should know better seem to have forgotten that there is considerable lead time necessary between authorization of funds and contract award. As the American Road Builders' Assn. Task Force Report put it: "Current practices on Federal-aid projects also disclose that an average of 21 months' lead time elapses from the date funds are authorized to where materials and equipment can be actually utilized at a job site. On the average, 17 months are needed for programming and development of plans, 2 months for advertising and award of contracts, and another 2 months for the contractors to establish himself on the job site."

This, of course, translates into a time lag before a contractor must augment his equipment fleet or purchase materials and supplies. And it is one of the reasons why those who mistakenly foresaw an immediately increased demand for their products have been disappointed. The more sober analysts, who did not let themselves become engulfed in a blaze of enthusiasm at the passage of the Federal Highway Act, have been justified. Nonetheless, look at what has been accomplished so far:

According to the U. S. Bureau of Public Roads' latest figures, 33,822 mi of highway were put under contract in the first six months of 1957, at a price of \$1,648 million. This is 6% more milage and 19% more dollars than the comparable period of 1956. As you would expect, by far the biggest gain has been on the Interstate System. Here \$459 million has been contracted for 1,085 mi of roads, which represents increases of 240% and 117% respectively.

Our own figures indicate \$2,160 million in roadbuilding contracts awarded in the first eight months of this year, up 31% over last year's comparable figure. And our forecast for the full year 1957 indicates a 29% rise over 1956. Next year's preliminary forecast indicates a 9% gain (p 46).

To say the roadbuilding picture is far from black is a gross understatement. If those who cry that the highway program has bogged down would only look at the over-all picture, not just their own narrow segment, they would not sell that program short.



SCAFFOLD and forms surrounding pier hang from steel trusses, move up when spans are jacked. New lift of concrete is added to piers after each 2 ft of jacking. Because of pier's taper, forms are adjusted before each lift.

PAIR of climbing jacks teams with second pair to raise ends of two adjoining spans. Precast blocks are placed under legs of yoke after each 6-in. lift. Jack inside yoke is retracted, block slid underneath, and operation repeated.

Climbing Jacks Raise Bridge

UNIQUE CLIMBING JACKS are the key to the spectacular raising of Montreal's Jacques Cartier Bridge over the St. Lawrence Seaway.

They are powerful, safe, and efficient. And with virtually no interruption of heavy four-lane traffic overhead, they are raising the bridge 50 ft above its original grade.

Basically, here's how it's done. Four climbing jacks are set up on each pier, replacing the anchorage shoes at each corner of the two adjoining truss spans. They consist of a 400- or 500-ton jack mounted upside down in a heavy steel yoke. And they operate by transferring the load back and forth between the jack and the two legs of the yoke.

In a synchronized operation, one pier at a time, pressure is applied to the four jacks, lifting the two spans and also the legs or pads of the yokes. When the

spans are raised 6 in., precast concrete blocks are placed under the pads, the ram is retracted, and another block placed under its head, completing the cycle.

During the next year, this operation will be repeated hundreds of times along the 14 spans as courses of pier concrete are placed around the blocks. And eventually, all spans will be jacked to their new grade on raised piers.

Complicated Job

The job is one of the most complicated on the Seaway. Jacking a bridge that high is a feat in itself, but maintaining traffic throughout is a job of spectacular proportions.

Yet there is no other way; traffic-choked Montreal is already short of bridges. Closing the span would be out of the question.

The purpose of the project is to provide ship clearance of 120

ft over the Seaway canal which passes between piers 9 and 10. Consisting of deck-truss spans, this approach section of the bridge originally provided only 40 ft of clearance. So, to get the additional 80 ft, the bridge is being jacked 50 ft, and the deck truss span over the canal is being replaced with a through truss to gain an additional 30 ft.

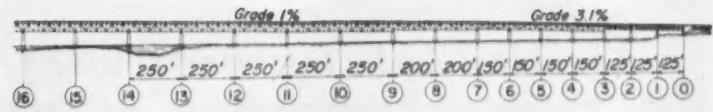
The problems are unique. A maximum roadway grade of 4.2% means that even the abutment on the south end must be raised 27 ft. Besides, the changing grades of the spans create complicated secondary stresses. And a jungle of conduits running across the bridge must be protected throughout the jacking.

The first job was to enlarge and modify the concrete piers to handle the additional height. Atlas Construction Co. of Montreal thickened 11 piers an average of 1½ ft on all surfaces. They an-

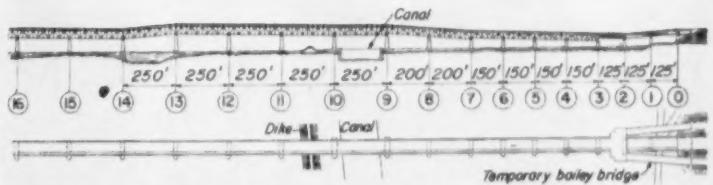
Here's the Plan

Original southern section of bridge before raising begins.

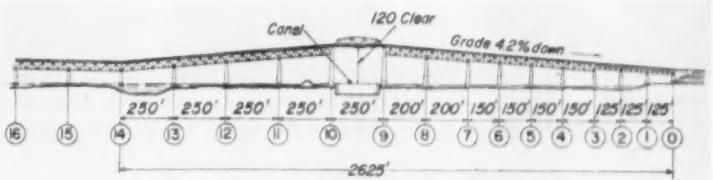
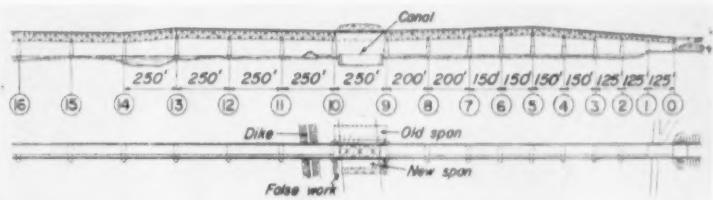
STAGE 1 • Traffic on Bailey bridges bypasses complicated work at abutment. Jacking begins on all spans, erection starts on new through span.



STAGE 2 • New through-truss at Span 10 is slid in as old deck-truss is slid out. Abutment and approach spans are completed, jacking continues on others.



STAGE 3 • Finally, after 1½ years of jacking, job is completed. Through-truss provides 120-ft clearance. Adjoining spans are jacked 50 ft.



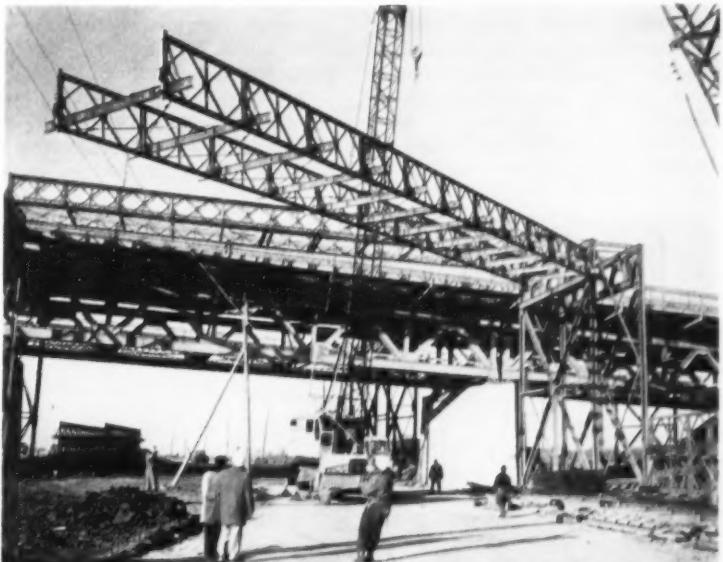
While Traffic Rolls

chored dowels in the existing masonry pier walls, erected forms, and then called in Intrusion-Prelakt, Inc., to build up concrete directly from the footings.

Bulk of the complicated steel work is handled by Dominion Bridge Co., Lachine, Que., under a \$7-million contract. Dominion started work at the south abutment, which had to be raised 27 ft. Naturally, the abutment modifications were too complicated to be made without bypassing traffic, so Bailey bridges were built on either side with turnoff platforms at Span 3.

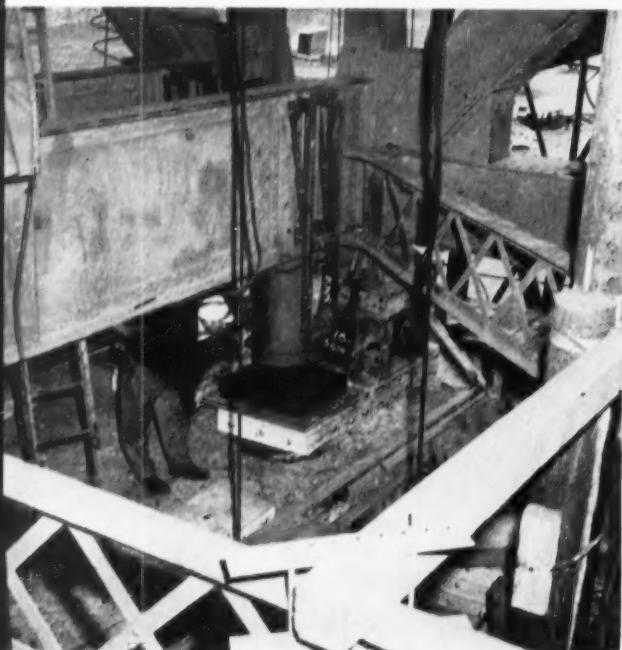
With traffic bypassed, Spans 1 and 2 were lifted so that the north end of Span 2 remained at its original elevation on Pier 2 and the south end of Span 1 was jacked 27 ft to its final elevation on the built-up abutment. At the same time, Pier 1 was increased in height about 13 ft.

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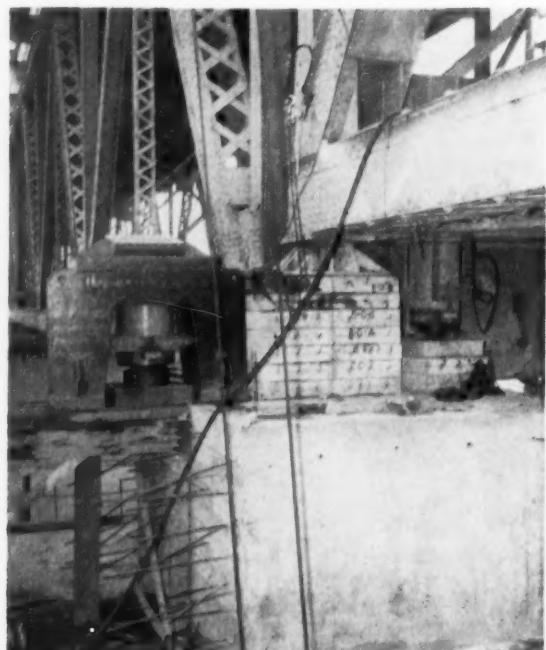


STEEL FRAME of Bailey bridge is erected near abutment. One end will rest on steel-frame-supported turnoff at Span 3. Identical Bailey goes on opposite side.

Climbing Jacks Installed Under Trusses



PRELIMINARY JACKING under transverse girders raises span's shoes enough to permit sliding in of climbing assemblies.



ANCHORAGE SHOE now is jacked 56 in., enough to accommodate climbing assembly (left). Shoe and blocks will be removed.

About 68 ft south of the original abutment, a new abutment was constructed because the additional approach fill required could not be supported by the old abutment. When the two abutments and their intermediate girder span were completed, the main bridge roadway was opened to traffic, and the Bailey bridges and turnouts were removed. For a week or two, however, this area provided a tough traffic problem. Vehicles had to be slowed as they traveled up a 4.2% final grade on the fill so that they could man-

age a bump where Span 1 sloped down abruptly at a 7.5% grade. However, fast jacking at Piers 1 and 2 quickly relieved the sharp change in grade.

The bump was impossible to eliminate earlier because jacking at Piers 1 and 2 was not possible until the Bailey bridges and their turnouts were removed from Span 3.

Preparatory Jacking

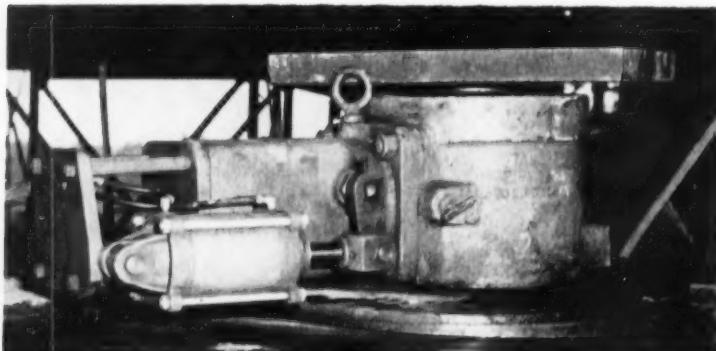
Although Dominion concentrated early on the abutment modifications, they assigned several crews to prepare the spans

for jacking. And there was a lot of work to be done. All spans had to be jacked about 56 in. off their piers to provide enough clearance for moving in the climbing assemblies.

All this preliminary jacking was done under the transverse girders that extend between the two trusses of each span. At times the clearance between girder and pier top was as little as 16 in.

To jack the transverse girders, Dominion used a number of jack sizes, depending on the clearance. In most cases, two 285-ton jacks at the downstream side and one 285-ton jack on the upstream side of the span did the job. (The downstream side is heavier). Mounted temporarily in frames on the transverse girders, these jacks raised spans in 6-in. increments as precast concrete blocks were placed under the span's support shoes. Traffic was halted temporarily each time because the transverse girder could not withstand a live load. However, most of the preparatory jacking was done at night when traffic was light.

When a span was raised 56 in. off a pier, jacks held the load while the precast blocks were



LOW HEADROOM under transverse girder requires 200-ton jack to begin lift. Later, higher jacks take over. Angle of jack's double-dish base plate is adjustable.



CLIMBING ASSEMBLIES perform all functions of normal anchorage bearings. Struts cut span's longitudinal movement.



PANEL BOARD powered electrically controls pair of jacks. Operator watches closely to maintain uniform runout.

taken out, the anchorage shoes removed, and the climbing jack assemblies skidded underneath. From this point the climbing jacks took over and pushed the spans to their final grade.

Climbing Jacks

Heart of the raising operation is the climbing jack assembly. Designed by Dominion engineers, it consists of a Tangye hydraulic jack centered upside down in a heavy welded steel yoke. Because jacks are interchangeable, the contractor will do the job with 50 yokes and 30 jacks.

There are several types of climbing assemblies, depending on the size of the load. Generally, a 400-ton jack is adequate under the lighter side of the shorter trusses, but a 500-ton unit with a heftier yoke is required at most other points.

All yokes are made to serve as normal truss anchorage bearings. On top, a rocker-type bearing assembly replaces the original truss shoe.

Some yokes are designed to serve only at the fixed ends of spans; others, at the movable ends. The only difference is in the pads at the base of the yoke's two

legs. The fixed yoke has solid steel pads, whereas the movable yoke has sliding pads. Layers of Lubrite lubricate pad surfaces to permit easy sliding when the spans expand or contract. But slotted fittings limit sliding to a few inches and keep movement under control.

Although the sliding feature is essential, it could complicate jacking when the fixed end of a span is raised. To solve this problem, Dominion engineers designed set screws in opposite ends of the feet. The set screws are easily turned up to lock the sliding pads when the fixed end is jacked.

Another function of the yoke is to mount a stability strut that checks any excess longitudinal movement of the span. The strut is hinged both to the yoke and to the bottom chord of the truss. It can be adjusted telescopically to fit changing load conditions that develop as the span's grade varies during raising.

Precision Operation

Actual jacking is a precision operation. And it has to be. A cumulative error in 50-ft of jacking could be substantial. For this reason, the precast concrete

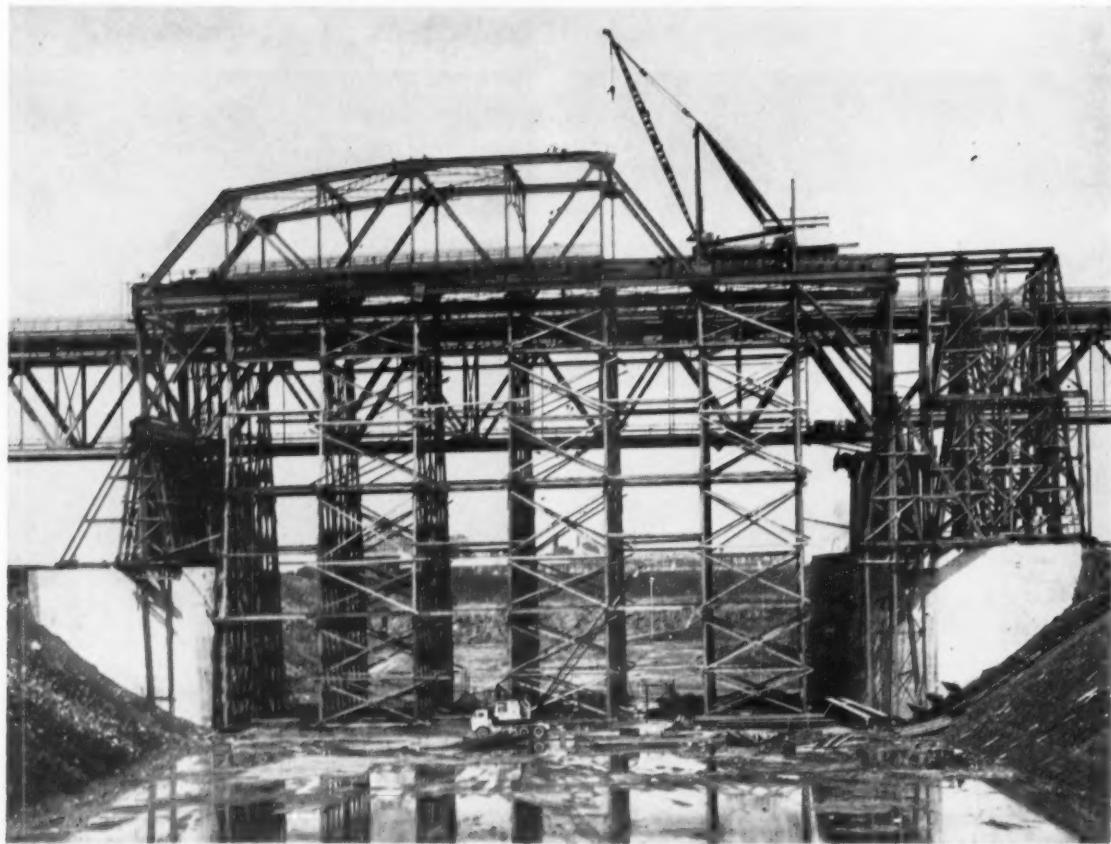
blocks are finished within a tolerance of 1/64 in. And to assure uniform loading, a sheet of 1/4-in. Fabreeka rubber compound is placed between pads and concrete blocks.

The 5-ton welded yoke itself was fabricated with extreme care to assure proper transmittal of the huge forces. For top strength and minimum weight, it was made with Lukens T-1 steel.

To distribute the huge load, a 26x31-in. plate is attached to the head of the 14-in. ram. Capable of an 8-in. stroke, the threaded ram is fitted with a large nut that is turned up to lock the load in case of any failure. As an additional safety precaution, 3/4-in. aluminum shims are built up under both pads as the yoke raises during jacking. When the pads raise 6 in., jacking is stopped and concrete blocks are carefully slid underneath as the aluminum shims are slid out. In this way, there is always a support under the pads in case of failure.

Each pair of climbing jacks is controlled from a single panel board. Thus two panel boards are set up for four-point jacking at each pier. Only 16 panels are

BRIDGE RAISING . . . continued



NEW THROUGH TRUSS nears completion on top of 140-ft high timber falsework supported on floor of Seaway canal. Separate

falsework for traveler will be transferred under bridge later to serve as runway when old span is slid out.

available on the job, so a certain amount of switching is necessary.

A panel operates two displacement pumps, each powered by a 6-hp electric motor. Working pressure is about 6,500 psi. Because one side of the span is heavier than the other, there is a tendency for one pair of jacks to run out faster than the opposite pair. To prevent this, the operator watches a gage that indicates the comparative runout so he can make proper adjustments.

The sequence and schedule of jacking is limited, of course, by the geometry of the bridge. Too much jacking at any one pier would cause a bump in the roadway. It also would open the roadway joint above the jacking point and close it at the opposite ends of the two spans. Generally, the gap is only 4 to 6 in., which is easily closed with a timber. But sometimes crews are forced to open it more, and a steel plate must be laid on top. So, jacking is limited at one time to the lift of

only one or two 6-in. blocks.

Whenever the spans over a particular pier are raised 2 ft, or four precast blocks, a course of concrete is poured on top of the pier. Forms hang from the span and move up with it. However, because of the pier's taper, an adjustment is made in the form before each lift.

New Span

At present, jacking has just begun on most of the piers. And the through truss that will replace the deck truss at Span 10 is nearing completion on a 140-ft high timber falsework supported on the floor of the Seaway canal.

When Span 10 is jacked to the proper elevation later this year, it will be slid out on falsework as the new truss is slid in. The entire operation probably will be completed in a matter of hours.

To facilitate subsequent jacking of the new span, it is being built on steel legs which bring its anchorage shoes down to the eleva-

tion of the pier top. When the job is completed, the legs will be surrounded by large concrete pier pedestals.

Two separate sets of falsework are used for the erection of the new span—one for its 20-ton traveler and one for the span itself. The big falsework under the span will be re-erected later on the opposite side of the bridge to facilitate dismantling of the old span. The falsework under the traveler will be re-erected later as a runway on which the old span will be slid.

Jacking will continue on all other piers until the proper elevations are reached. At this point, the climbing jacks will be removed by a reverse of the procedure by which they were installed and replaced by the spans' original anchorage shoes.

Ross Chamberlain is project engineer for Dominion Bridge Co., and Dr. P. L. Pratley is consulting engineer. Verne Carr is superintendent.

Chemically Made Rock Seals Foundation Pit

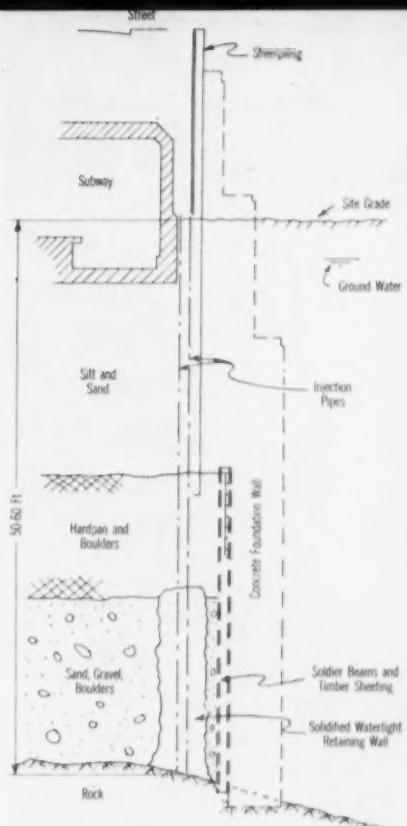
AROUND PART of a deep foundation excavation for a New York City skyscraper is a subterranean solid sandstone dike. Nature didn't put it there, man did—by controlled injections of chemicals from ground surface that turned water-bearing sand and gravel into impervious rock. Only alternative, and an expensive one, would have been to sink pneumatic caissons to seal off the wet strata.

The feat was performed at the block-square site of the new 60-story central office building of the Chase Manhattan Bank in lower Manhattan. The structure's thick foundation walls have to go down to bedrock, which is as much as 87 ft below ground level. General scheme was to build the concrete walls within a double-walled perimeter cofferdam of steel sheetpiling.

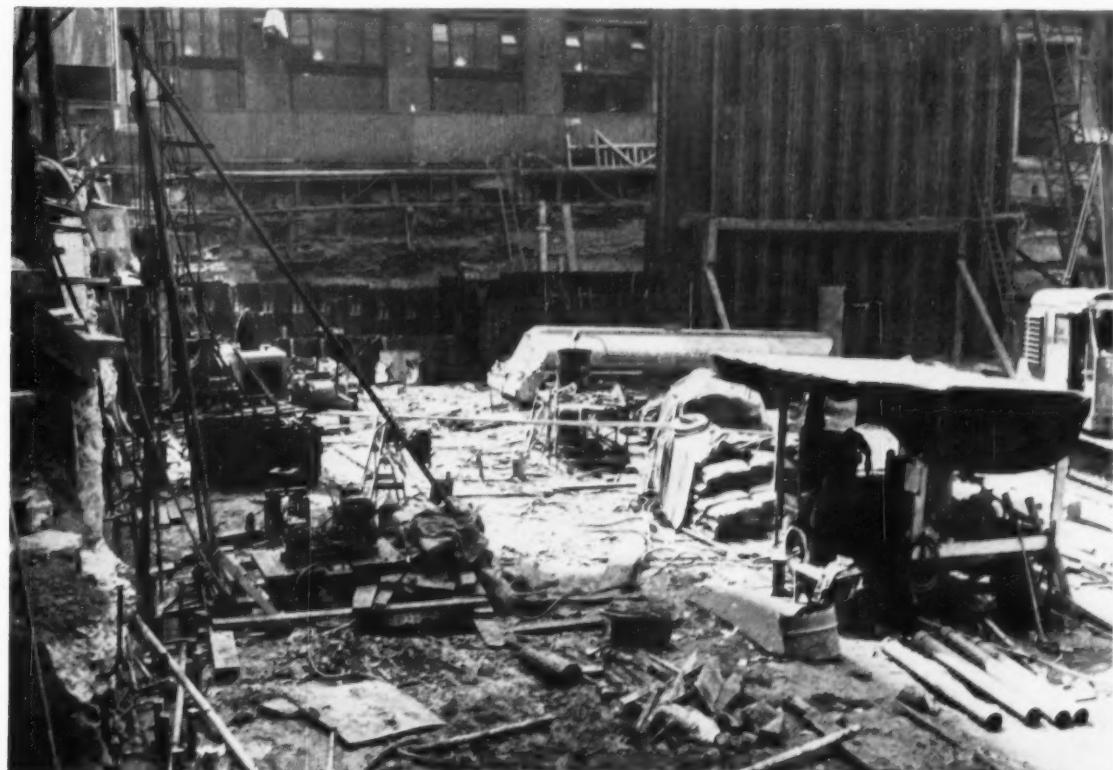
Ground at the site is a wet silt and sand above a layer of bouldery hardpan lying on top of bedrock. But at one end of the site, a large lens of water-bearing sand and gravel, with many heavy boulders, intruded between bedrock and hardpan.

This saturated layer could not be sealed off by sheetpiling because the hardpan above it was too dense to drive through. And to make a cutoff by sinking a line of concrete box caissons under air pressure would have been terrifically expensive and time consuming.

Instead, foundation joint-venturer Foundation-Brewster-Meile called in Chicago's Chemical Soil Solidification Co. to treat the wet ground and make it tight. This they did by alternately injecting sodium silicate and calcium chloride solutions. Reacting with



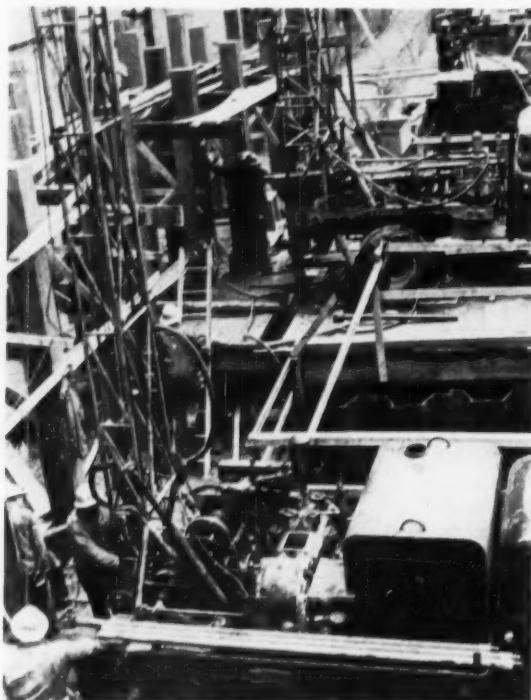
TYPICAL SECTION through site perimeter shows chemical-solidified water barrier.



JOB PANORAMA indicates equipment necessary to change water-bearing sand and gravel into sandstone. From left are capped in-

jection pipes, pipe withdrawal hoist, pipe drilling machine, 3,200-gal Fruehauf chemical trailer, chemical mix apparatus.

CHEMICALLY MADE ROCK... continued



INJECTION HOLES ARE DRILLED by truck-mounted rotaries. Drilled and cased holes enable injection pipes to pass hardpan.

the sand and gravel to form a sort of sandstone, the chemicals solidified a watertight barrier some 5 ft thick and extending from bedrock to hardpan. This cutoff wall held back water and helped prevent subsidence of a rapid-transit subway structure alongside, as the excavation for the foundation wall proceeded.

Chemical Soil did their injection work from general site grade an average of 50 to 60 ft above the bottom of the layer to be sealed. Average depth of the injected layer was 18 ft. In all, some 160 injection pipes were put down, generally 30 in. center to center and staggered in two parallel rows 10 to 15 in. apart.

Because of the denseness of the hardpan that had to be penetrated, the injection pipes were set in drilled and cased holes. These were put down by Warren George Drilling Co., whose Failing and Mayhew rotary drills carried 4½-in. roller bits.

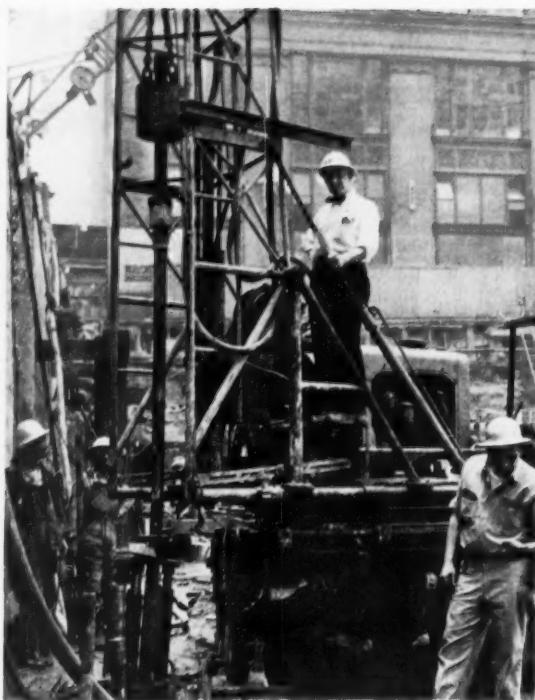
Into the cased hole an injection pipe was placed. Made up of 10-ft lengths of round drill rod with "A"-thread internal couplings, the pipe was 1½ in. o.d., ¾ in. i.d. Its tip was fitted with a conical plug to keep soil out of the pipe.

When ready to inject chemicals, the casing first was pulled up a couple of feet. Then a ¾-in. tool-steel rod, in 10-ft sections with flush couplings, was run down inside the injection pipe to knock out the plug at the tip.

A length of high-pressure hose was attached to the top of the pipe. The other end of the hose ran to a "Christmas tree" with three valved inlets—one for water, one for sodium silicate, one for calcium chloride. Inlets were fitted with Nordstrom lubricated valves. Supplying the chemical solutions to the Christmas tree were two Gardner-Denver grout pumps.

At the start of an injection, the pipe was given a shot of water to make sure the tip was clear. Then 15 to 18 gal of sodium silicate solution were pumped in, followed immediately by an injection of calcium chloride solution. A small slug of water was introduced into the pipe between chemicals to minimize their reacting with each other inside the pipe and plugging it.

After the first pair of injections, the pipe was pulled up in about 1-ft successive stages and the alternate chemical injections continued, but at a reduced dosage.



PIPE IS PULLED by tackle from Acker drilling machine on Army surplus 6x6 truck. Machine normally drives injection pipes.

During this time the casing was kept about 10 ft above the tip of the injection pipe. When hardpan was reached, pipe and casing were withdrawn.

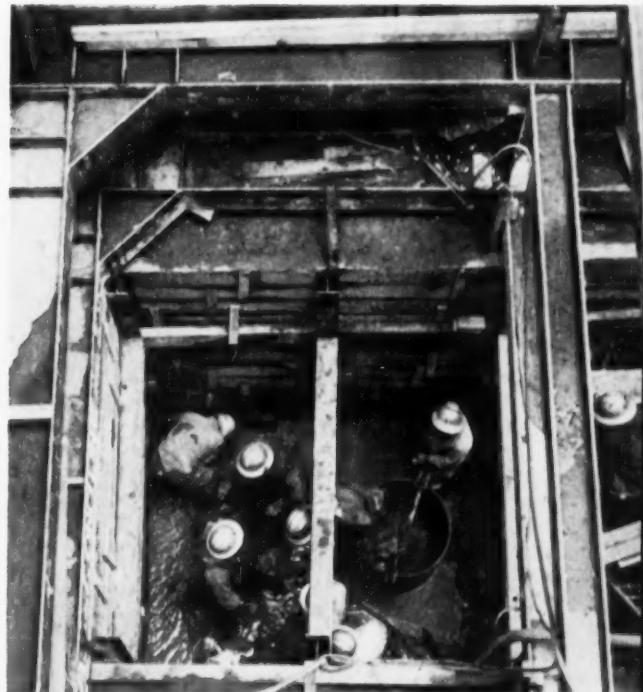
This left a column of watertight sandstone from bedrock to hardpan, where once there had been nothing but wet, running, porous material. Injection of adjacent and subsequent holes built a series of overlapping and interlocking columns of sandstone that formed a cutoff wall to seal the wet layer.

Originally it was planned to inject through 190 holes. However, because the chemicals penetrated farther from the pipe than expected, only 157 were needed. But the chemical solidification process also was put to good use in other areas of the foundation job. Because of the bouldery material, a number of steel sheetpiling interlocks were ripped during driving. When subsequent excavation uncovered the breaks, water rushed in. To stop it, an injection pipe was driven through a window burned in the sheeting and the two chemicals pumped in to harden the wet material. In all, 13 such areas had to be treated.

The original injection work was scheduled to be completed in



PIPE IS JACKED OUT of ground by pipe-slip head atop two 50-ton Blackhawk jacks fitted with springs for piston withdrawal.



PIT IS EXCAVATED inside horizontal timber sheeting after chemicals have solidified wet, running ground. Water's from rain.

41 working days, and took 42. Nearly 59,000 gal of sodium silicate was injected, delivered in tank-trailer lots by Philadelphia Quartz Co. This was augmented by 200 tons of bagged Solvay calcium chloride that was mixed into solution on the job. Injection pressures were 150 to 600 psi.

The job worked three 8-hr shifts per day, with two separate seven-man crews and sets of equipment each shift. In each crew were one pump keyman, one pipe keyman, three maintenance men, and two helpers.

Best progress was injection through eight pipes in one day. Average depth of wet ground solidified was 18 ft.

Foundation contractor was a joint venture of The Foundation Co., New York City; George M. Brewster & Son Inc., Bogota, N. J.; and Joseph Miele Construction Co. Inc., Maplewood, N. J. Project manager was Lou Miller. C. Martin Riedel was in charge of the work of Chemical Soil Solidification Co., Chicago, with Leo Oler as general superintendent and Bill O'Donnell superintendent. Consulting engineers were New York's Moran, Proctor, Mueser & Rutledge, with George Hammond as resident.



SHEETING IS SEALED, after interlocks were ripped by driving through boulders, by injecting chemicals into running sand. At right is "Christmas tree" injector.



PLANT 1

JOB-BUILT UNIT crushes and screens gravel for use in airport runway base. Capacity of 130-ft long plant is 650 tph.

PLANT 2

REFINED VERSION of job-built aggregate plant is more compact, riding on only one trailer. Its capacity is 400 tph.

Big Agg Plants Go Mobile

TWO 100-TON SCREENING and crushing plants of the type usually mounted on solid foundations have been put on wheels and set to crawling across the North Dakota plains on an \$11.7-million runway paving project at the Grand Forks Air Force Base.

The mobile plants are a key to the effort of Western Contracting Corp., Sioux City, Iowa, to accomplish—and in a single season—its share of converting an expanse of North Dakota farmland into a combination fighter and bomber base. Turning out 10,000 tons of base course material

per 20-hr day, the crushing and screening plants are matched by highballing paving spreads that place 5,000 cu yd of concrete in daily in daylight hours alone.

In tackling the job, Western has taken on a project massive in size. The paving involves 380,000 cu yd of concrete in slabs ranging from 16 to 24 in. in thickness. The 300-ft wide runway, with overruns, is 14,350 ft long; the taxiway, 75 ft wide, is the same length. Aprons total 1,920,000 sq ft. It was necessary to remove 102,000 yd of frost susceptible subgrade and replace it with sand

and gravel. And job requirements called for the placing of 1,100,000 tons of base course, most of it 18 in. thick, under the concrete.

The difficulties posed by the size of the job are compounded by the time schedule. A project of this scope might easily take three seasons. Specifications required it to be done in two. In taking on the job in a country where climate may limit the working season to 90 days, Western elected to do it in just one season. The firm, with the resources to mobilize mass equipment, preferred to do the job in a

On Yazoo River Basin Project, Yazoo County, Miss.

PIONEER GETS HIGH PRODUCTION FROM CAT* LOWBOWL SCRAPERS



DW20-NO. 456 LOWBOWL SCRAPER is push-loaded by a giant D9 Tractor. LOWBOWL design loads more material with less resistance clear to the end of the loading cycle for quicker heaped loads.



DW21-NO. 470 LOWBOWL SCRAPER speeds heaped load on haul. Turbocharged 6-cylinder Cat Engine, also in the DW20, delivers 300 HP (maximum output)—power aplenty for working in tough conditions.

At the time these pictures were taken, Pioneer Contracting Co., Inc., Memphis, had completed 100 working days of a schedule calling for 600. The project, involving 2,045,000 cu. yd. of earthmoving on the Yazoo River Basin, covers some 7 miles of work on channels, levees, drainage ditches and road relocation. There's a fleet of Caterpillar-built units on the job, including two DW20-No. 456 LOWBOWL Scrapers, a DW21-No. 470 LOWBOWL Scraper and a giant D9. They work 24 hours a day, 5 days a week. Says Pioneer's Scraper Foreman R. C. Parker: "We prefer Caterpillar-built equipment because of ease of operation. You can also depend on them for a minimum of down time. And wherever we are, Caterpillar Dealer service is always available."

Reports from job after job show that, under identical job conditions, Cat LOWBOWL Scrapers get bigger loads faster than competitive units. Both the four-wheel DW20-No. 456 and the two-wheel DW21-

No. 470 have capacities of 18 cu. yd. struck and 25 cu. yd. heaped. Their LOWBOWL design loads more material with less resistance clear to the end of the loading cycle for quicker heaped loads. And the Turbocharged 6-cylinder Caterpillar Engine delivers 300 HP (maximum output) for fast loading, hauling against adverse grades and dumping in tough going.

Whether you're a two-wheel or a four-wheel man, you can count on profitable production from LOWBOWL Scrapers. Your Caterpillar Dealer will be glad to show you competitive production facts and figures from actual jobs. Better still, name the date—he'll demonstrate on your job.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

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**WANTED—
THE HARD WORK**

BIG AGG PLANTS GO MOBILE . . . continued



PLANT 1

LOADING HOPPER is made from parts of old Euclid bottom-dump wagons. Horizontal belt feeder is concealed in wagon body. Trussed towing tongue connects hopper to plant.



PLANT 2

CONE CRUSHER, a 4-ft Symons standard, is mounted in center of trailer. It receives oversize from Simplicity 4x16-ft triple-deck vibrating screen, reduces it to 1 in.

single season rather than tie up investment for a two-year job.

The size of Western's bite is made more difficult to chew by terrain and climate. The air field site is underlain by ground water, collected in inter-locking lenses, that comes within 2 ft of the surface. The climate is outranked in severity only by Siberia's. There is a silt-clay soil over much of the area.

These factors compound into extremely deep frost penetration and extensive frost heaving. To safeguard the slab from upheaval, Western over much of the area is having to strip away as much as 6

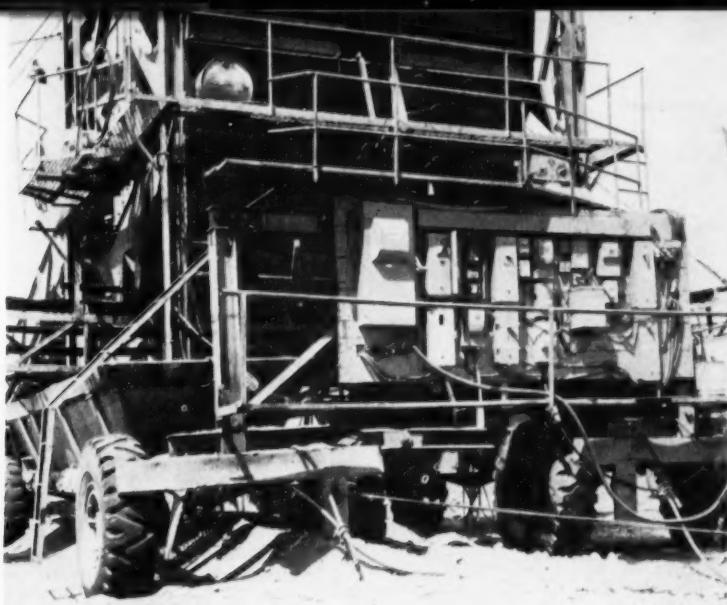
ft of native soil and replace it with selected materials. Specifications call for removal of 52,000 cu yd of frost-susceptible subgrade but the firm has overrun this by 50,000 yd.

Nature has given an assist in supplying the tremendous quantity of sand and gravel needed for the subgrade and base course. The general area of the base is located in the bed of what, a few geological eras ago, was Lake Agassiz. As the water of the lake retreated it laid down beach deposits of sand and gravel. They are visible as barely discernible ridges, lying parallel to each

other, running northwest-southeast and stretching out interminably. These beach deposits provide the source of the base course and subgrade materials needed.

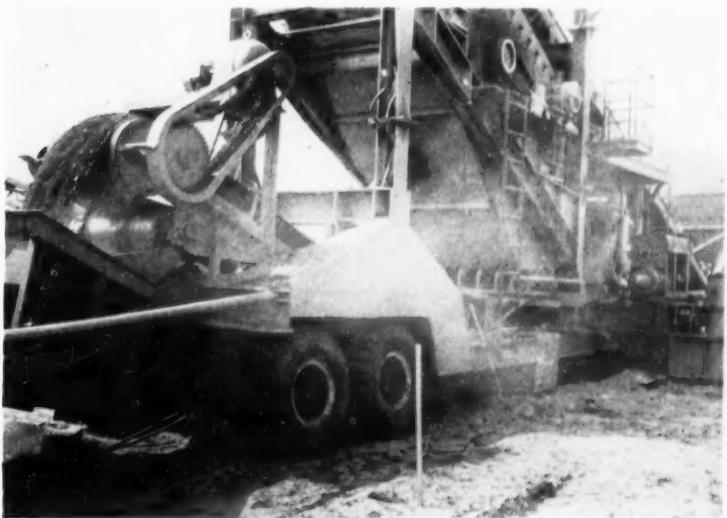
In giving its assist, geology did so grudgingly. The material varies widely. It ranges from a preponderance of silt and clay through clean sand to gravelly sand. The deposits vary in width from 100 to 1,000 ft. A layer may be as much as 6 ft thick; elsewhere it peters out to nothing. When processing takes place, wastage may run as high as 50%.

To process the material so unpromisingly available, Western



PLANT 1

PARALLEL WAGONS, also made from parts of old Euclid units, carry screening plant. Weighing 50 tons, screening unit is 26 ft wide and 40 ft high, has two Simplicity 4x16-ft triple-deck vibrating screens.



PLANT 2

SINGLE TRAILER with 16 tires carries package plant, which is 114 ft long, 26 ft wide, 45 ft high, and weighs some 80 tons. At right is one of four 10-in. hydraulic jacks on outriggers that steady operating unit.

had two choices, neither satisfactory. They were:

- Use commercially manufactured portable crushing and screening plants. The capacity of the largest of these was so small that an uneconomically large investment in a fleet would be required. The portable plants also lacked the flexibility of control demanded by the nature of the job; it was questionable whether they could handle such a high proportion of fines.
- Station a conventional stationary crushing and screening plant of adequate capacity at the site of the beach deposits. This prom-

ised to require an uneconomical amount of handling and hauling. Two truckloads of material would have to be brought in for every truckload of product taken out. It also posed the problem of wastage disposal.

Western's way out of the dilemma was to put wheels under a stationary plant with a 650-tph capacity. Refinements suggested by field use of the first plant were engineered into a second plant that also is in operation. The performance of the two is measured by an output of 10,000 tons per day.

A 6-yd Manitowoc 4500 drag-

line with 90-ft boom and a Bucyrus-Erie 6-yd 71-B drag with 110 ft of boom feed the plants. Operating pattern, where width permits, is to work the deposits in cuts 150-ft wide. The draglines reach as far as they can, and the rest of the distance is worked by Caterpillar D9 dozers that shove material to the draglines.

Waste material from the plants is spilled by conveyor back into the worked-over area. Between times, the dozers spread piled waste and overburden to level the land to tillable condition. This eases the problem of negotiating with owners for permission to work their land.

At intervals the draglines and dozers pull the plants ahead by cable. The frequency of moves is determined by depth of material within reach. In a good deposit, the plants may be able to work half a day in one spot. On other occasions as many as five moves are necessary in a 20-hr working day.

Plant No. 1

Western's first crushing and screening plant stretches out over 130 ft. While mighty efficient, it is somewhat crude in appearance. But that's because the job-built unit incorporates parts and assemblies from rigs not normally associated with an aggregates processing plant.

The feed hopper, for example, was made from parts of old 18-yd Euclid bottom-dump wagons. A second set of wheels was added to one wagon, and a 15-yd hopper was set above the body. Top of the hopper was fitted with a bar grizzly to reject plus 10-in. material.

From the hopper, material passing the grizzly falls to a 48-in. horizontal belt conveyor, or feeder, in the Euc wagon body. This transfers material to a 36-in. by 83-ft inclined belt that leads to the top of the screening plant.

The screening plant is fitted with two Simplicity 6x14-ft triple-deck inclined vibrating screens. Gates give a wide flexibility of control—an especially important factor at the Grand Forks job. Specifications permit the contractor five alternate formulas of screen size in base course material. Control over the widely varying feed to the plant permits maximum use of material, thereby reducing handling and wastage.

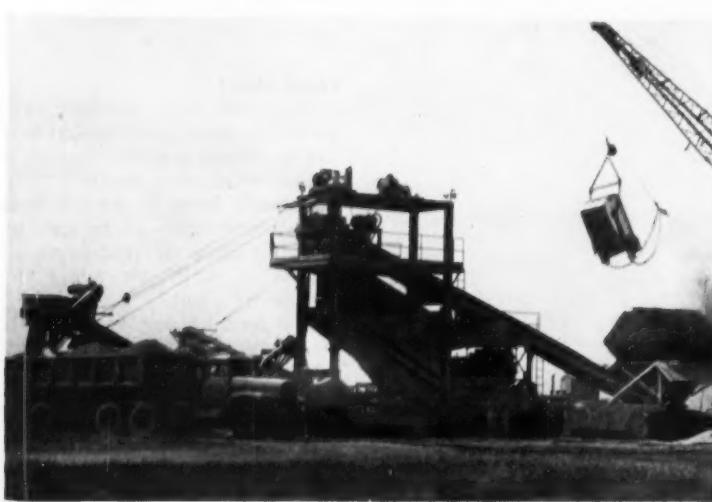
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BIG AGG PLANTS GO MOBILE . . . continued



PLANT 1

WASTE CONVEYOR takes excess fines, which run as high as 50% of raw feed in some instances, and dumps them back into excavation. Conveyor is 71 ft long, carries 30-in. belt. Dozer later will level spoil pile.



PLANT 2

ROUND-THE-CLOCK OPERATION of crushing and screening plants is necessary to turn out 1,100,000 tons of processed base course material in short season. Note electric winches atop plant to vary conveyors.

The screening unit weighs 50 tons and is 26 ft wide excluding conveyors. It is mounted on two parallel four-wheel trailers made of parts from old Euclid wagons. The trailers are coupled together by pinned beams so they can oscillate independently. And the plant's legs rest on the trailers' centerlines so the unit remains quite stable during moves, despite its 40-ft height. Power for conveyors, screens, and night lighting is supplied by a 125-kw Caterpillar D17000 diesel-electric generator set.

Maximum size aggregate permitted in the base course is 1 in.

The screens' top decks scalp off oversize, which a short belt conveys to a Symons 4-ft standard cone crusher. After reduction in the cone, material is carried back in closed circuit to the main feed belt by a 24-in. belt conveyor 48 ft long.

The crusher and its power unit—a 155-hp Cummins diesel engine salvaged from an old C Tournapull—are mounted on a 12-wheel trailer. The unit with its attached conveyor weighs 30 tons.

Two 30-in. transverse belt conveyors are mounted beneath the screens on the main unit. One

extends 71 ft to discharge waste back into the area from which the dragline has excavated feed material. The other, 45 ft long, loads processed material into trucks for hauling to the air field.

Plant No. 2

Western's second plant is somewhat smaller than the original unit they put together, having a 400-tph capacity. But it is a complete self-contained package 114 ft long, 24 ft wide, and 45 ft high. Weighing in the neighborhood of 80 tons, it is carried on a single 16-wheel trailer. Narrower and higher than the No. 1 plant, No. 2 is steadied during operation by four 10-in. hydraulic jacks on transverse outriggers. Design and construction of the plant was a joint effort of Western's Grand Forks' job forces, its Sioux City headquarters and shop personnel, and Los Angeles machinery consultant Charles W. Jones.

On one end of the plant trailer is a 9-yd feed hopper with dual sloping grizzlies to reject plus 10-in. material. Non-reject falls to a 65-ft by 36-in. belt conveyor that feeds a single Simplicity 6x14-ft triple-deck inclined vibrating screen.

As in the No. 1 plant, oversize goes through a Symons 4-ft cone driven by Cummins 155-hp diesel. There is no provision for returning crushed material to the screens. Instead a 41-ft by 35-in. horizontal belt conveyor takes both crusher-run and screened material out to the front of the trailer where it dumps to a similar inclined conveyor that loads haul trucks. Waste is carried by a 30-ft by 24-in. elevating belt for discharge back into the pit. Electric winches atop the plant control the elevation of finished-product and waste belts. This plant, too, carries a Cat D-17000 electric set for power.

Base Course Placement

From the processing plants, base course material is trucked 10 mi to the air field. For the job, Western assembled a fleet of 25 Dorsey semi-trailer rear dumps fitted with Daybrook hydraulic hoists and pulled by International R212 truck-tractors. The units ride on 18 tires and were specially designed to carry a 21-ton load, the maximum permitted by North Dakota law.

continued on page 105



CHOSEN AFTER TESTS with competing brands of masonry cement, Atlas Mortar goes into gymnasium, monastery and chapel of Mendel Catholic High School, Chicago, Illinois. Architect A. F. Moratz and Contractor Van Etten Bros. report results fully up to expectations with exact light color desired.

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Big windshield, curved to eliminate sidepost obstruction, pushes out in an emergency under 40 lb. pressure.



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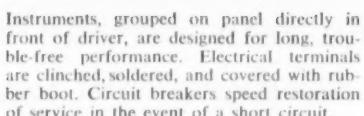
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Instruments, grouped on panel directly in front of driver, are designed for long, trouble-free performance. Electrical terminals are clinched, soldered, and covered with rubber boot. Circuit breakers speed restoration of service in the event of a short circuit.

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AUTOCAR TRUCKS

AUTOCAR DIVISION, The White Motor Company

Exton, Pa.



BIG AGG PLANTS GO MOBILE . . . continued from page 102

The trucks dump into one of two Jersey spreaders hooked onto Allis-Chalmers HD-19 tractors. Spread in 8-in. lifts, the material next is worked over by Seaman Trav-L-Plants. The mixers correct any segregation caused by the 10-mi haul and also add water to bring the base course to optimum moisture content for proper compaction.

Although specifications require a 4-in. filter blanket under the base course, the gradation requirements for the two strata overlap. By judicious mixing, Western turns out a product that meets both sets of requirements. This eliminates one separate placement and fine grading cycle.

After being worked over by the Seaman mixers, the 8-in. lifts are compacted to 6 in. by vibrating rollers and vibrating plate-type units. Terrapac rollers consolidate the lower lifts while Lima Roadpackers compact the final one.

Paving Setup

Pavement slabs are 16 to 24 in. thick and call for nearly 400,000 cu yd of concrete. Because it would have been uneconomical to procure special forms for the thicker slabs, Western made do with the regular 12x16-in. and 16x18-in. Heltzel paving forms they already had. Solution was to bolt steel risers to the form top to make up the depth required.



OPERATING PROCEDURE FOR BOTH PLANTS is to feed them by 6-yd dragline, assisted by D9 bulldozer, that excavates shallow but long gravel deposits. Manitowoc 4500 works with Plant 1 (top), while Bucyrus-Erie 71-B attends Plant 2 (above).

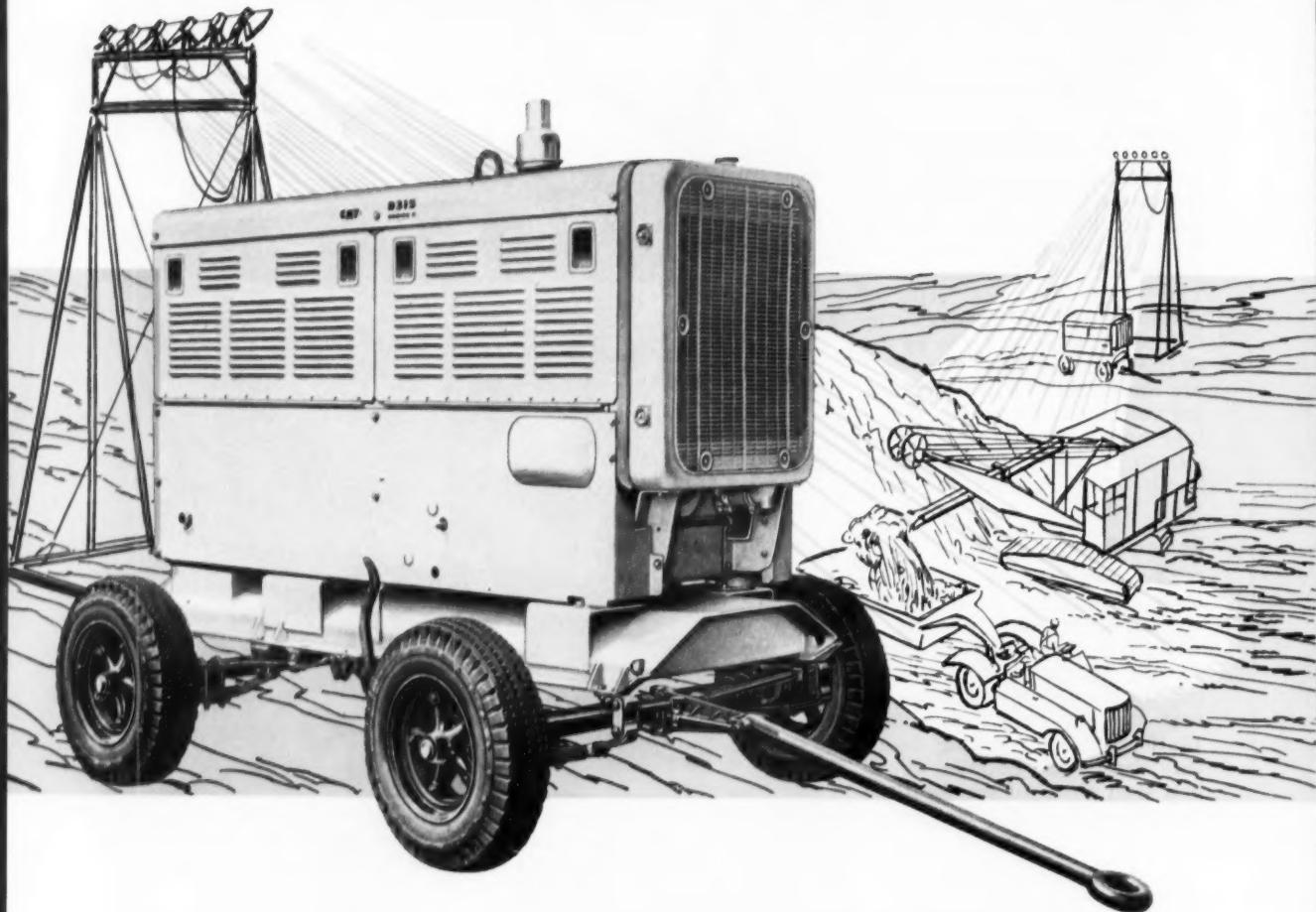


FOR NIGHT PLACING OF BASE COURSE, area is lighted by 12 of these floodlight units. Mounted on Dodge Power Wagons, each hydraulically actuated pole carries seven 1,500-w lights and is supplied electricity by a 16½-kw U.S. motor-generator set.

Western worked out another wrinkle to handle dowel bars that span the longitudinal joints. These 1½- and 2-in. steel rods are 24 in. long. Normal procedure is to cut holes in the forms to receive the dowels. This complicates form stripping, and the protruding rods necessitate hand work for final grading of the adjacent slab. Instead, Western designed simple pipe inserts into which dowels are placed later. A plate with welded nut closes off the inner end of the pipe, and a cap screw extending through the form and inside the pipe into the nut holds the insert tight against the form face. After concreting, removal of the cap screw frees the form for stripping. When the next slab is ready for pouring, dowels are merely slipped inside the pipes.

continued on page 109

BIG NEWS FOR



When you want power you can count on—portable power that rolls or skids easily to your work location—you can't beat the new, compact, easy-handling Cat Portable Electric Sets with matched, self-regulated Cat Generators.

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Increase Profits by bringing the power to the job with these modern Caterpillar Portable Electric Sets. These new units earn their keep in a hurry—supply-

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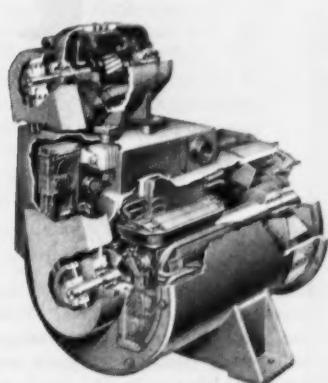
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Forget Maintenance Worries. This rugged unit combines the latest Cat Diesel Engine with matched, self-regulated Cat Generator. Only adjustments necessary are fan belt tension and valve clearance.

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Equipped with direct electric starting, these units are started and controlled from the instrument panel. New Cat D311 Portable Electric Set, rated at 30 KW (continuous duty). New Cat D315 (Series G) Portable Electric Set, rated at 40 KW. New D318 (Series G) rated at 60 KW.

Each of these portable electric sets is completely enclosed, with built-in safety features. Control panel is enclosed; flexible conduit protects all wiring. Switchgear has weatherproof covering with doors which can be closed in foul weather. Terminal board is easily accessible. Entire unit is simple to service.



A GENERATOR YOU CAN COUNT ON

The all-new, matching, self-regulated Cat Generator is amazingly compact, simple to operate and easily synchronized. It has constant voltage; starts motors fast. Produces 60-cycle, three-phase current at a choice of 120, 240, 120/280 or 480 volts at 1,800 RPM. Regulator has no moving parts, so operation is simple, maintenance easy, and no adjustments are necessary after the initial setting. Voltage is adjustable from 5% above to 10% below nominal rating and regulated within 3½% of rated voltage. Easily adjustable for parallel operation.

Dept. C, Engine Division

CATERPILLAR TRACTOR CO., Peoria, Illinois, U. S. A.

Send me more information about the new Caterpillar Portable Electric Sets as I may be in the market for such a unit. I understand that I am under no obligation.

Name _____

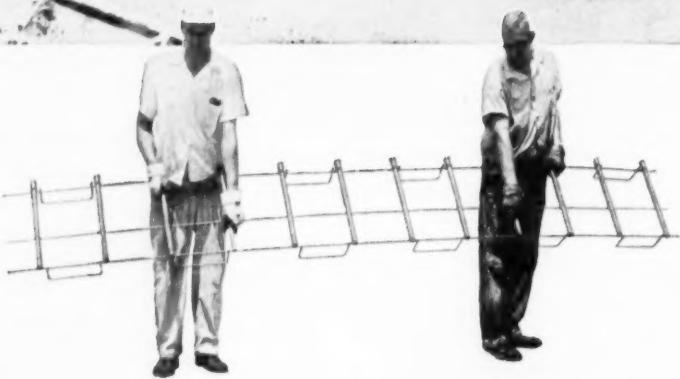
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LACLEDE pre-assembled dowel units



Save Field Labor...

Speed Highway and Airport Construction

All parts of Laclede dowel assemblies for expansion, contraction and construction joints (expansion sleeves, chairs, spacing devices) are precision-welded into one unit at the plant before delivery to the job. This pre-assembly insures an accurate easily handled one piece unit permitting fast installation with reduced field labor costs. The dowels are maintained in rigid alignment. Where specified, the units may be furnished painted or coated, eliminating a time consuming and costly job operation.

OTHER LACLEDE HIGHWAY STEELS:

- Multi-rib round reinforcing bars
- Center joints
- Tie bars
- Accessories



LACLEDE

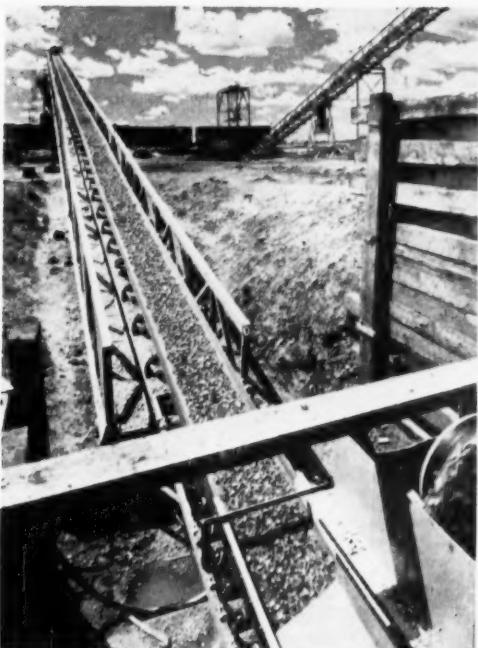
LACLEDE STEEL COMPANY

SAINT LOUIS, MISSOURI



Producers of Steel for Industry and Construction

Batching Facilities Are Extensive



COARSE AGGREGATE pours from stockpile's reclaiming belt and goes to batch plant over long 30-in. conveyor.



BATCHING UNITS for pavement concrete are set up in duplicate. Coarse aggregates are batched at rear, cement in center, sand in foreground.

Because of the high-speed characteristics of the jets that will use the field, concrete surface tolerance is held to $\frac{1}{8}$ in. in 16 ft. To achieve this, Western measures to thousandths in setting and later rechecking paving forms. And paving operations are conducted only during daylight hours.

Good Production

Nevertheless, 4,500 to 5,000 yd of concrete are placed daily by up to seven Koehring 34-E Twinbatch pavers. To supply them, Western set up dual batching facilities.

Course aggregate comes in by rail at the rate of 90 to 105 cars per day. From the cars, material falls to two Syntron vibrating pan feeders that move it to a 36-in. stacking conveyor. From here aggregate is carried by 36-in. cross conveyor to one of two stockpiles (for $\frac{3}{4}$ -in. and $1\frac{1}{2}$ -in. sizes) over an 8-ft Armco reclaiming tunnel. Air-actuated gates let material fall to a 36-in. reclaiming belt that dumps to a 30-in. feed belt to the batch plant. Here coarse aggregate is split four ways to serve two parallel batch units with Johnson automatic controls.



CONCRETE SAND, produced by Western at another site, is hauled in by truck. Michigan tractor shovel moves dumped material to hopper where feeder loads it to belt.

There are two cement batching stations and a dual sand batcher, all with Johnson units. Cement comes in by rail, sand by truck. From stockpile, a Michigan 175 tractor shovel pushes sand to a hopper over a 30-in. belt conveyor that feeds the batching units. Western subbed out batch haul-

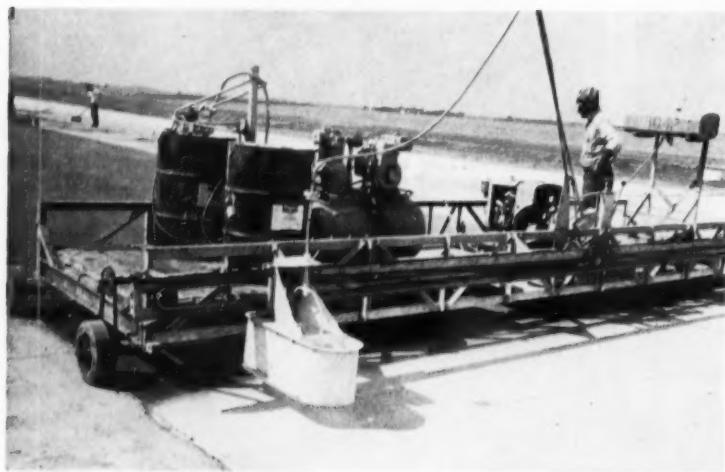
ing, which is handled by a fleet of miscellaneous four-batch trucks. These feed the Koehring pavers, which are operated in spreads of as many as three pavers each. With each spread, the follow-up equipment consists of a Blaw-Knox spreader, Jaeger finisher, Koehring bull-float, and

Paving Machines Place 24-in. Slabs



PAVING SPREAD on thick runway slab includes three Koehring 34-E Twinbatch pavers, Blaw-Knox spreader, Jaeger finisher, and a

Koehring longitudinal finisher. Machine in foreground is a belting machine Western converted out of an old finisher.



FINAL MACHINE in paving train is Heltzel spray-curing rig. To increase its capacity, Western added a double nozzle, and keeps compound stirred with paint mixer.

Heltzel belting machine. A Heltzel spray-curing machine applying Protex white-pigmented compound completes the train.

Later, Clipper and Champion saws with diamond blades cut transverse joints on 25-ft centers. Western has tried about 10 different brands of blades, with varying degrees of success.

Scheduling Pavers

Major headache is phasing the work so the pavers can be used elsewhere on the job while concrete is curing on a newly placed portion. This is complicated by the different thicknesses of the slab and by lane widths that vary from 21 to 25 feet, which requires changing screeds, longitudinal floats, spreaders, and the like.

Plans are to have Grand Forks in operation by the fall of 1959. Current estimate of the total cost is \$45 million. So far, \$33 million in contracts have been awarded since work started last season.

Men on the Job

The Grand Forks work is being carried out by the Omaha District Office of Army Engineers, Col. David G. Hammon District Engineer, J. O. Ackerman, chief of engineering, Bart Stokes, acting chief of military construction, and Maj. Milton Stevens, area engineer. Western Contracting Corp. is headed by Hubert Everist, Sr., chairman of the board. Marshall Jones is president. Gene E. Williams is project manager.



PINKY PINKMAN, Western's paving superintendent, examines holes to hold dowel bars. They were formed by pipes bolted to forms to ease form stripping and fine grading.

NO HEAD ANGLE ADJUSTMENTS TO MAKE!



HI-LO CONTROL WHEEL

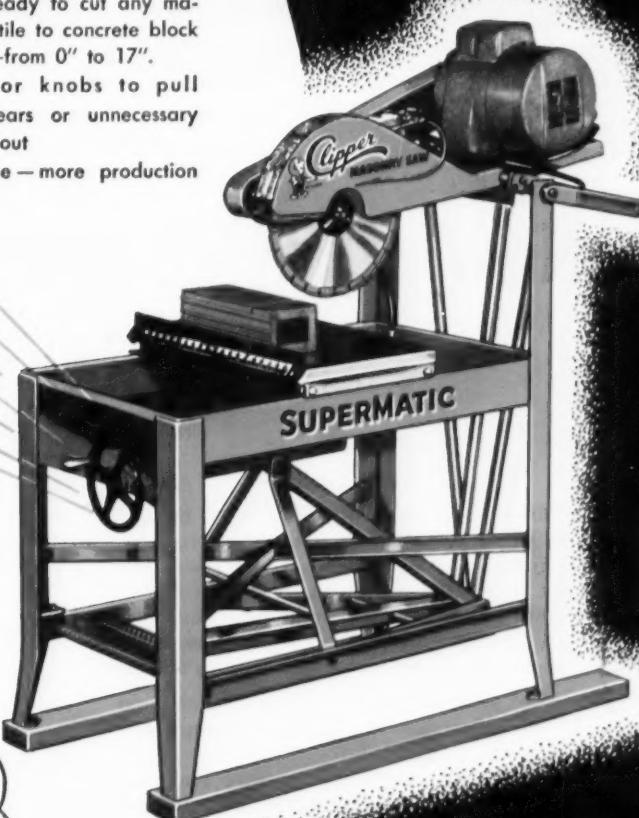
Does Everything!

YES . . . HI-LO does everything! Without turning off motor, you position Cutting Head, ready to cut any material from wall tile to concrete block—at any height—from 0" to 17".

- No levers or knobs to pull
- No slides, gears or unnecessary parts to wear out
- No down time—more production time



SUPERMATIC has over 30 outstanding features found on no other masonry saw—including the specially designed 2 H.P. G.E. motor...Heavy Duty Sta-Level Cutting Head with giant size shaft and housing and the all new conveyor cart you can't cut in two. Ask for FREE TRIAL!



THERE'S A CLIPPER BLADE
FOR EVERY JOB!
DIAMOND . . .
BREAK-RESISTANT . . .
ABRASIVE

MR. CLIPPER

Call collect for FREE TRIAL on a
SUPERMATIC or SELECT-A-NOTCH
Masonry Saw Today. Priced from \$335.

Sold Direct by Clipper Factory Trained Representatives

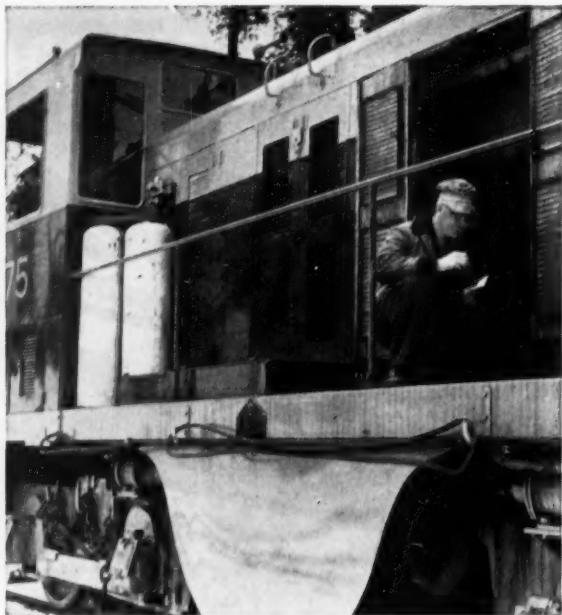
THE CLIPPER MANUFACTURING CO. 2800 WARWICK, KANSAS CITY 8, MO.

Offices in Principal Cities Throughout the World

Factories in ENGLAND, FRANCE, GERMANY, ITALY



A single drop of used oil from this truck indicates true condition of the vehicle's oil . . . and tells a lot about the engine's operation.



Daily oil checks assure maximum lubrication efficiency in this diesel locomotive.

Now—they're testing used oil in minutes

THE NEED for a fast, accurate and practical method for determining the condition of used oil has long been one of the more serious problems confronting fleet operators. It's obviously wasteful to discard still-good oil, but operating a vehicle with contaminated oil could lead to costly engine damage. This was an unsolvable condition which maintenance men had come to accept.

Since no two vehicles, even of the same-make and model, are identical in performance or operation, maintenance men were compelled to compromise on oil change "averages" recommended by engine manufacturers. This procedure is uncertain and costly. Fortunately, this operating conflict has been resolved with the introduction of a simple but completely reliable oil check system . . . the Shell ADC Oilprint Analysis.

The ADC Analysis was primarily conceived to determine proper oil change intervals for individual engines. However, it goes much further. It is capable of actually reducing engine maintenance costs by disclosing certain mechanical defects *before* they have caused serious engine damage.

The test procedure is very simple . . . requires little

practice to perfect . . . and provides a reliable check of oil from merely two drops of used oil. In minutes, the degree of Alkalinity, Dispersancy and Contamination can be determined easily.

Here are several typical examples from various areas of the country. They show how fleet operators, employing both diesel and gasoline engines, have successfully and profitably applied the ADC program.

A Kansas City Freight Line

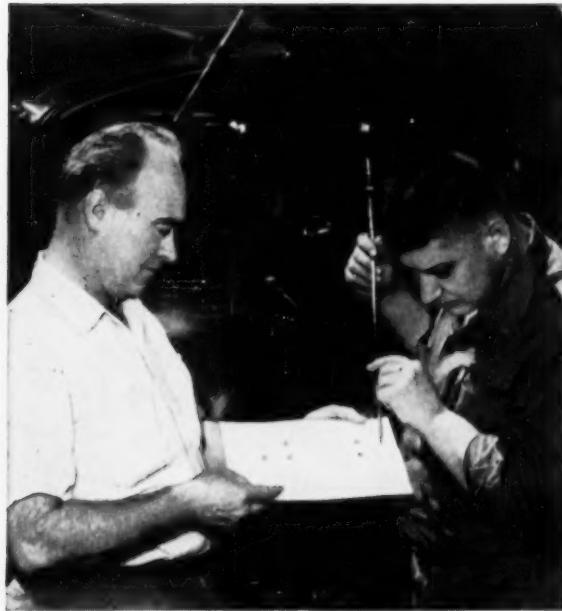
Operating a large fleet of trucks, one Kansas City freight line previously had drained and replaced oil every 3,000 miles. After adopting the ADC Oilprint Analysis, individual test charts showed that, in most cases, drainage would not be necessary at less than 6,000-mile intervals. Even at this doubled interval, engine life was not affected. Further proof was established when these engines were inspected at 87,000 miles and no appreciable wear was found on bearings, pistons, rings or valves.

An Idaho Logging Operation

Oil had previously been drained after a limited number of hours of use on an Idaho company's diesel locomo-



Substantial oil economy is realized in this tractor, because oil is changed only when indicated by the Oilprint.



Taking a quick "fingerprint" of crankcase oil from an interstate carrier.

tives. With the ADC Oilprint Analysis as a guide, the oil-change interval has now been safely increased many-fold. The savings made possible by this on-the-spot test in oil, filter change and labor costs were considerable. Furthermore, leaky head gaskets are frequently discovered before any serious engine trouble develops. Here is another valuable plus for the ADC Oilprint Analysis.

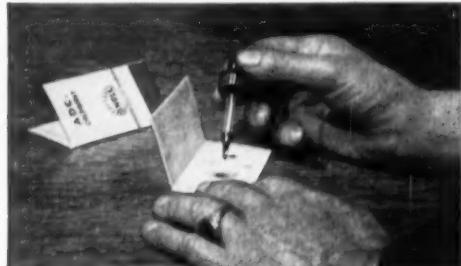
A Washington, D.C., Transit Company

This transit company operates a large fleet of buses with both gasoline and diesel engines in use. With the difference in operating schedules . . . rush hours, short and long hauls, around-the-clock schedules . . . both engine types were believed to require complete oil changes every 2,000 miles. When the ADC program was instituted, the tests showed that oil-drain periods and minor maintenance checks could be safely extended to every 3,000 miles for gasoline engines and 4,000 miles for diesel engines.

Fleet operators, who are concerned with extending the service of crankcase oil and avoiding the risk of using contaminated oil, are invited to sit in while a Shell service engineer demonstrates the time-and-money advantages of an ADC Oilprint Analysis program.



Photo shows an oil-spot test card . . . one phase in the visual life record of a change of oil.



One drop of a special indicator* fluid developed by Shell checks the alkaline reserve in the oil.

*Indicator Fluid U.S. Patent No. 2,770,530

SHELL OIL COMPANY

50 WEST 50TH STREET, NEW YORK 20, NEW YORK
100 BUSH STREET, SAN FRANCISCO 6, CALIFORNIA





JAEGER "600" ROTARY easily powers dual 4" drill rig in 18' limestone ledge at Nelson Brothers quarry, Lathrop, Kansas.

Compressor maintains plenty of reserve power behind the drills at characteristic slow, economical operating speeds.

How Jaeger air cuts drilling cost

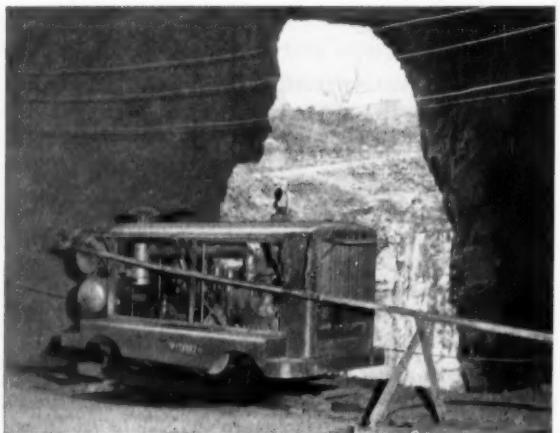
Same mobile "600" saves money in quarry and on 450,000-ton excavation for Turnpike

With its Model 6-71 GM diesel engine easing along at fuel-saving speeds that never reach 1650 rpm, this truck-mounted Jaeger "600" rotary compressor powers two 4" drills at top production efficiency in limestone quarry supplying concrete and road aggregates.

Over long hours of steady drilling, the slow-speed, efficient operation of the Jaeger "600" (1650 rpm full load speed instead of 1750-1800) means substantial savings in fuel and engine and compressor wear. These savings were repeated when Nelson Brothers, the owners, shifted their mobile rig to a 450,000-ton rock excavation project for the Kansas Turnpike.

Slow-running, efficient performance, resulting in fuel economy, fewer fpm of engine piston travel and thousands fewer compressor revolutions per hour, is characteristic of all Jaeger rotaries. Smaller units (125, 250 and 365 cfm) deliver full volume at 1700 rpm versus 1800 to 1950 rpm in similar compressors having no more than equal, and often less, air capacity.

It will pay you to make your next compressor a Jaeger. Call or visit your Jaeger distributor for full details and prices, or write us for Catalog JCR-5.



LOGS 400' (IN 12'-18' DEPTHS) PER 8-HOUR SHIFT, IN HARD MISSOURI LIMESTONE: Using only 36 gallons of fuel per 8 hours, Jaeger "600" powers two 4" drifters to this average daily production in Federal Materials Company underground quarry, Cape Girardeau, Mo. Jaeger slow-speed, high efficiency performance saves fuel and wear on every job.

THE JAEGER MACHINE COMPANY

800 Dublin Avenue, Columbus 16, Ohio

PUMPS • CONCRETE MIXERS • SPREADERS • FINISHERS • TRUCK MIXERS

DW15s BOOST PRODUCTION FOR STRUNK BROS., CATERPILLAR USERS FOR 18 YEARS!



Strunk Bros. of Tiskilwa, Illinois, started in business 18 years ago with Caterpillar-built equipment. The company has good reason for keeping its spread all Caterpillar. Here's why: these rugged yellow machines have meant money-making performance to Strunk Bros. And excellent service from the Caterpillar Dealer has kept the machines on the move.

On this job on Federal Aid Rt. 168, Putnam County, Strunk Bros. is using four DW15s with Scrapers, four D8 Tractors, one D7 Tractor and two No. 12 Motor Graders. The job involves 103,507 cu. yd. of earth excavation and 120,642 cu. yd. of borrow excavation. Owner Harry Strunk says CAT* machines boost production, are economical on fuel and have little down time.

Now a new DW15 (Series E) Tractor with new No. 428 LOWBOWL Scraper

No matter how good a job a machine does, Caterpillar engineers are constantly looking for ways to improve it. And, the new model is *not* made available until it has been thoroughly job tested. That's the story behind the new DW15 (Series E)-No. 428 LOWBOWL Scraper. It's ready. The DW15's engine delivers 200 HP (maximum output capacity). With speeds up to 37.2 MPH, plus the extra sure-footedness of four wheels, the DW15 gives you faster hauls and cycle times with greater safety. The No. 428 Scraper has a capacity of 13 cu. yd. struck—18 cu. yd. heaped—and it loads quicker and more easily because of LOWBOWL design.

Your Caterpillar Dealer will gladly demonstrate the new DW15 and show you how it can pay off for you!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

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ONE GOAL: To concentrate our capabilities, resources and experience on the design, manufacture, distribution and service of job-tested heavy equipment.

THE LATEST, MOST COMPLETE INFORMATION ON THE NEW HIGHWAY PROGRAM — FREE

Here in one booklet is all the latest information on the new highway program. Find out how, where and when the money will be spent; standards for the new freeways; final routes of the Interstate System. Everything you need to know to share in the greatest construction job in history.

Dept. CM&E-9, Caterpillar Tractor Co.
Peoria, Ill.

Please send me immediately copies of "The Road Ahead."

Name.....

Company.....

Address.....

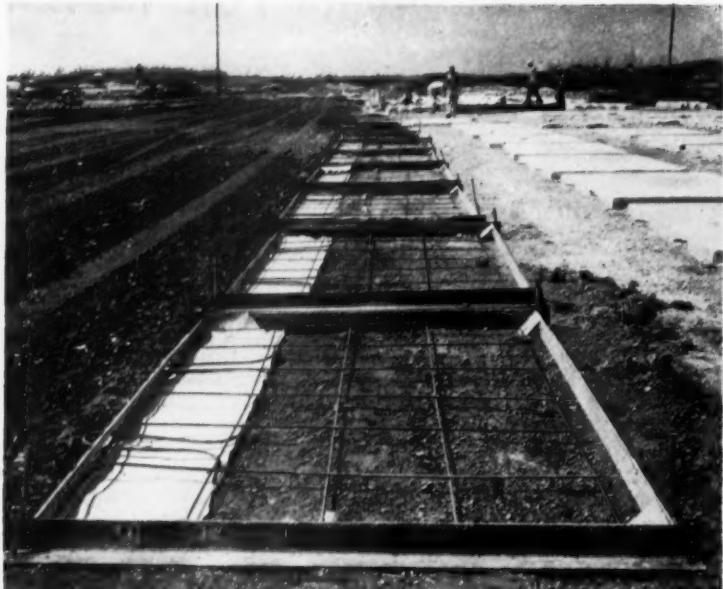
City..... State.....





FORMS FOR PILES—Multiple form makes five at once. Paper tubes shape bolt holes.

Casting Piles and Slabs . . .



FORMS FOR SLABS—Four steel angles on level ground make economical form for 6x8 ft slab. V-shaped notches at bottom of slab fit similar notches on piles.

Builder Cuts Seawall Costs

By CHARLES S. HICKS
Chief Engineer, Layne, Inc.
Hallandale, Fla.

THERE'S NOTHING like experience to help you do a job right. By "right" I mean performance at the lowest possible cost and with maximum quality.

The people in our organization have had all kinds of experience

in land development, home building, etc. But in one vital area of the big job confronting us here at Golden Isles—the construction of seawalls—none of us had a dime's worth.

And in Golden Isles, Florida's newest luxury development, we need 14 mi of seawalls. We are taking 550 acres of typical, low-lying Florida mangrove swamp

and turning it into a series of contoured islands ideal for luxury dwellings.

To fashion our islands, we dig 120-ft-wide canals, using the fill to form the islands themselves. Around each island, of course, we have to throw a seawall to contain the land, keep the blue water out.

Our seawall, designed by Maule Industries of Miami, Fla., is a combination of tapered concrete piles and 6x8-ft precast slabs 6 in. thick. Piles and slabs fit together snugly without grouting. The top 6 ft of the pile is T-shaped. The slab fits between the webs of the T's on two piles, and the flanges hold it in position.

Two notches at the bottom corners of the slab fit into identical sockets at the base of the T-sections on the piles. The notches are sloped so that the slab's own weight forces it against the pile to form a tight connection.

A 2x2-ft reinforced concrete deadman 4 in. thick helps hold the piles vertical against the outward earth pressure. A 13-ft tie rod connects pile and deadman.

When piles and slabs are in position and backfilling is complete,



OVERALL PROJECT—Artist's sketch shows Golden Isles luxury housing development. Seawalls on crescent-shaped island and three others are nearly finished.

Driving the Piles

a reinforced concrete cap 18 in. wide and 6 in. deep is formed along the top. Unlike the piles and slabs, this cap is not precast.

When we examined bids from subcontractors who specialize in this kind of work, the cost looked disturbingly high—about \$25 per lineal ft. So, even though it was a new type of work for us, we decided to build the seawalls ourselves.

We cleared an area and set it up as our central yard for the casting of reinforced concrete slabs and piles. We designed wood forms for both, selected crews for the job, and got to work.

But anyone new in any business makes mistakes; and errors cost money. We poured slabs and pilings and installed our first few hundred feet of beautiful seawall. We were proud of ourselves—until we checked on our costs. We were manufacturing and installing the seawall at a cost of \$40 per lineal ft. Far too much.

Re-examining the operation, it was apparent we were wasting time, manpower, and money by fabricating in that central yard. We had to handle the slabs and pilings too many times before each piece was put into its place.

Also, the wood forms for the slabs weren't working well. Breakage during stripping was too frequent, and we had to spend time repairing forms when we should have been manufacturing or installing the seawall.

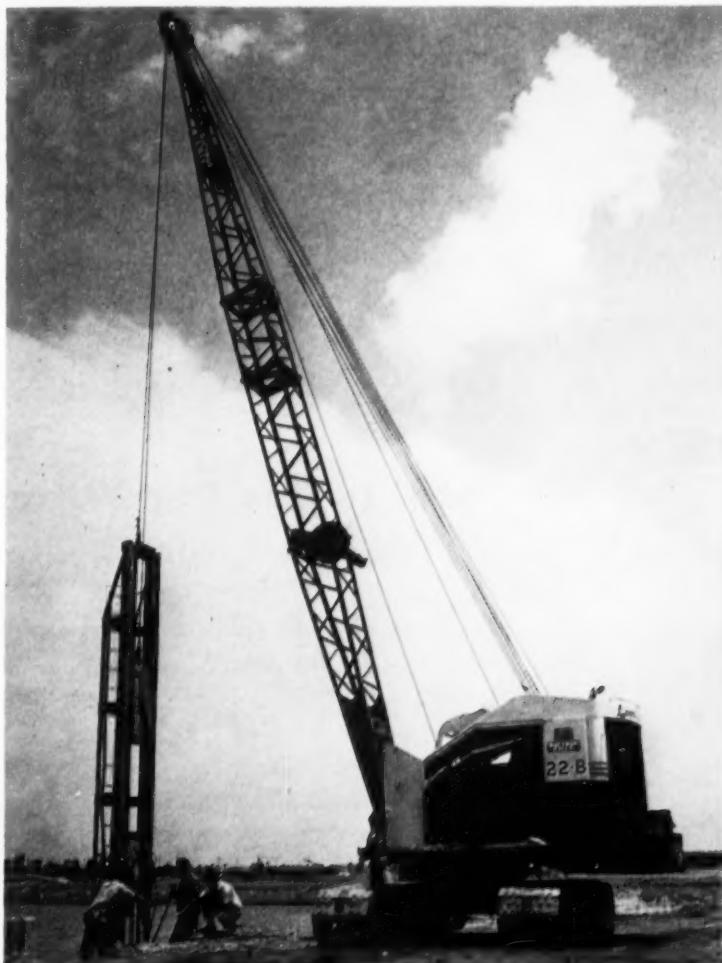
To cut costs, we decided to go to steel forms for the slabs even though they are much more expensive initially. And to minimize the handling problem, we decided to manufacture components right at each installation site.

As soon as we place the fill for an island, we level off an area adjacent to the water where we can cast the slabs and piles needed there. Using the ground as a form leaves one side of the slab rough, but that's all right because backfill will cover that side. We finish the other side of the slab because it faces the sea and is exposed to view.

We place a strip of paper on the ground near the top of the slab to get a surface smooth enough so that forms for the cap will fit on accurately. Four 3x4-in. angles form the sides. To key the corners of the forms the vertical leg on one angle is cut away



POSITIONING—Template made of two 54-ft steel beams helps position piles. Piles must be placed and driven accurately so precast slabs will fit between them.



DRIVING—Drop hammer weighs 2,500 lb., falls 9 ft to drive average pile in 7 min. Objective is 2-ft penetration into rock, but refusal after 15 in. is acceptable.

MAKE MONEY ON WET JOBS



Red River Pipeline Crossing — Texas

Dig Them In The Dry With A Moretrench Wellpoint System

For interesting data on this modern method of handling wet excavation profitably, send for our illustrated catalog.

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Canadian Representative: Geo. W. CROTHERS Limited, Toronto, Ontario

Brazilian Representative: Oscar Tavares & Co., Ltd., Rio de Janeiro

so that its horizontal leg extends under the other angle. A metal stake pins both angles to the ground through a common hole.

Within a couple of months we had our production up to 60 piles and 50 slabs per day. One of the most important factors in our increased production was the fact that we kept each of our crews working as a unit so that each individual developed specialized ability in his particular part of the job.

And with the steel forms, we could pour twice a day into the same forms. Remember, we had to pour at least 10 days ahead to give the slabs and piles time to cure. After 10 days, concrete tests at 3,000 psi.

We cast the piles five at a time in a multiple form. Steel cups set into the forms provide the four-way taper at the pile ends. We are still using wood forms for the piles, but we will switch to steel forms soon.

To simplify installation of the seawall we designed a templet consisting of two 54-ft steel beam sections. It accommodates six piles and five slabs. When the templet is anchored into place at the shoreline, all the pile-driving crew has to do is slip each pile into a slot and drive it.

On large radius curves the templet forms a series of straight chords that the curved cap covers. For short radius curves we use a curved timber templet supported on two 50-ft steel beams.

It takes 7 min to drive the average pile with a 2,500-lb drop hammer falling 9 ft. Usually driving continues until the pile penetrates 2 ft into the coral rock bottom. But a pile that reaches refusal after 15 in. is acceptable.

The cushion block on the pile during driving is made from an Australian pine stump. It is 14 in. in dia and 6 to 8 in. thick. We place oak or pine blocks 4 in. thick between the block and the pile to transfer the shock of the hammer blow evenly and prevent chipping of the concrete.

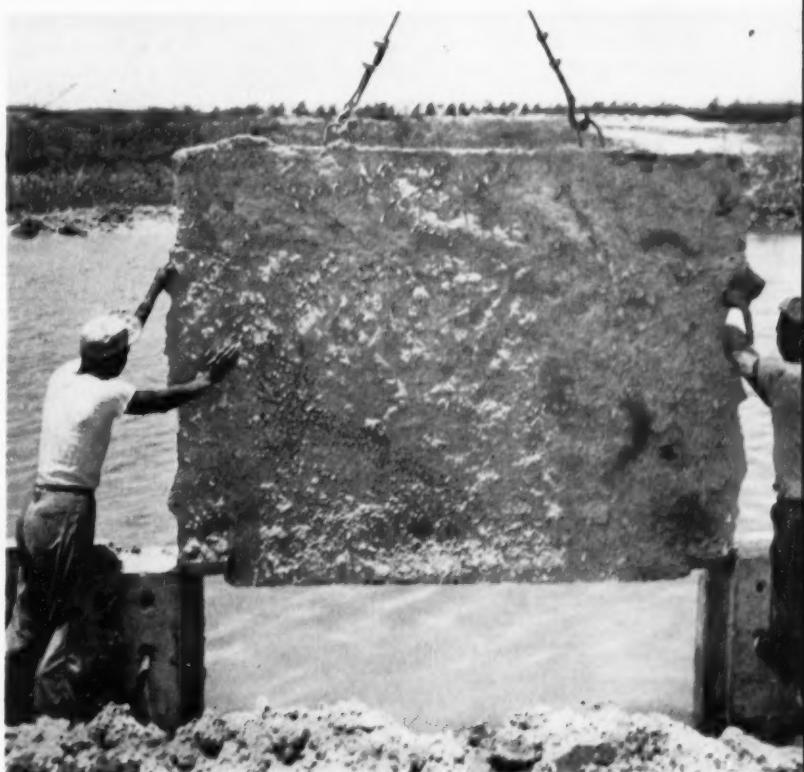
The tip of the pile measures 4x4 in. and contains extra reinforcing but no special driving point. The 18x10-in. top section of the pile also contains extra reinforcing.

We found that the most efficient machine for installing the

Placing the Slabs



BACKHOE lifts slab from casting yard to position on wall using steel loops specially inserted for the purpose. Same machine then digs trench for deadman and tie rod.



SLAB slides into position between two piles. Notches at bottom corners fit similar notches on piles. These notches plus flanges on pile and backfill hold slab in place.

Cap and Backfill Complete Job



PILES AND SLABS are now in place. Cable from piles extends 13 ft to buried concrete deadman. Wood blocks hold slab temporarily in place until backfill is complete.

slabs is a backhoe. The backhoe operator can make a cut for the 13-ft tie rod between the pile and the deadman, then backfill the trench, and pick up a slab by protruding loops of reinforcing steel at the top with a double-hook sling over the shovel.

We bolt wood blocks across the pile and against each slab simply to hold everything together until the space behind the slabs is backfilled. Blocks are removed as the area is filled.

Capping teams come directly behind installing crews. They set the 18-in.-wide, 6-in.-high cap forms, place $\frac{3}{8}$ -in. reinforcing rods, then pour and finish the concrete.

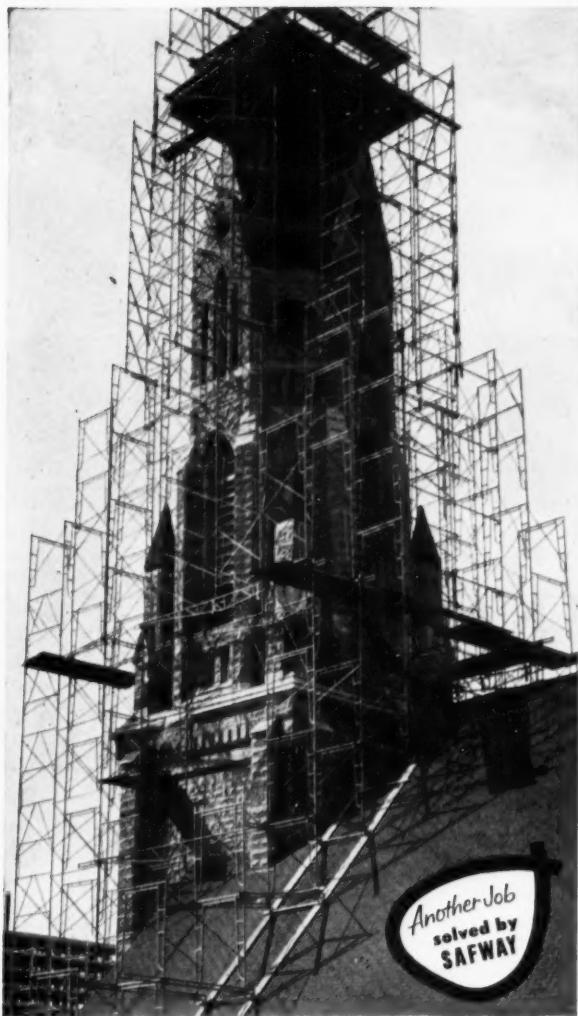
We're satisfied we've got our seawall problem licked, and we have gained valuable experience in this type of construction. Our crews now are installing a daily average of 200 lineal ft of seawall.

Figuring the price, we know it costs us less than \$20 per lineal ft in place. That's about \$5 per lineal ft less than the bids we got from subcontractors. It adds up to a saving of more than \$350,000 for the entire 14 mi of seawall.



POURING THE CAP is the last major phase of the seawall erection. Cap is 18 in. wide, 6 in. deep and contains $\frac{3}{8}$ -in. reinforcing steel.

Cap is cast in place using wood forms and is trowel finished to improve appearance of wall.

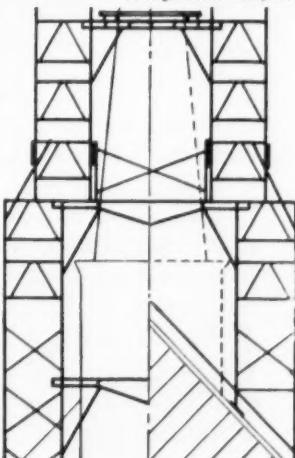


SCAFFOLD 'STEPPED IN' AS STEEPLE TAPERS

This detail drawing shows how standard Safway frames and accessories are used in stepping back the scaffolding to follow the contours of the tapering church steeple.

The base scaffolding is built up partly from the ground and partly from the sloping roof. Swivel base plates adjust automatically to the roof angle. The base towers are spanned with trussed "putlogs."

The stepped-back scaffolding is supported on the horizontal putlogs by means of U-shaped saddle pins. Thus frames can be mounted at any points desired.



Write FOR FREE BULLETIN



Learn all about Safway scaffolding and the many advantages it can give you. Write today for your copy of the new Bulletin 19. If you don't know where your local Safway office is located, ask us to tell you.

How to Scaffold a Tall Steeple from a Sloping Surface

FRAMES ARE 'STEPPED IN' TO FOLLOW STEEPLE CONTOUR

SCAFFOLDING a towering church steeple over a sloping roof is no routine problem. Yet Safway scaffolding service . . . using standard Safway equipment . . . offers a safe and easy solution, as demonstrated at St. Joseph's Catholic Church in Chicago.

Planned and erected by Safway's Chicago office, this scaffold helped contractors complete a tricky job *on schedule . . . and profitably*. Men and materials quickly moved up to platforms as high as 160 ft. At every level, plenty of elbow room with complete safety resulted in better, faster work.

Swivel base plates permit setting scaffold frames on the sloping roof. At upper levels, scaffolding is stepped inward as the steeple narrows, making it possible to locate workers close to the job—even between pilasters. Trussed "putlogs" span open areas between towers to provide support for upper level scaffolding with maximum efficiency and at lowest cost.

SAFWAY SERVICE CAN HELP YOU

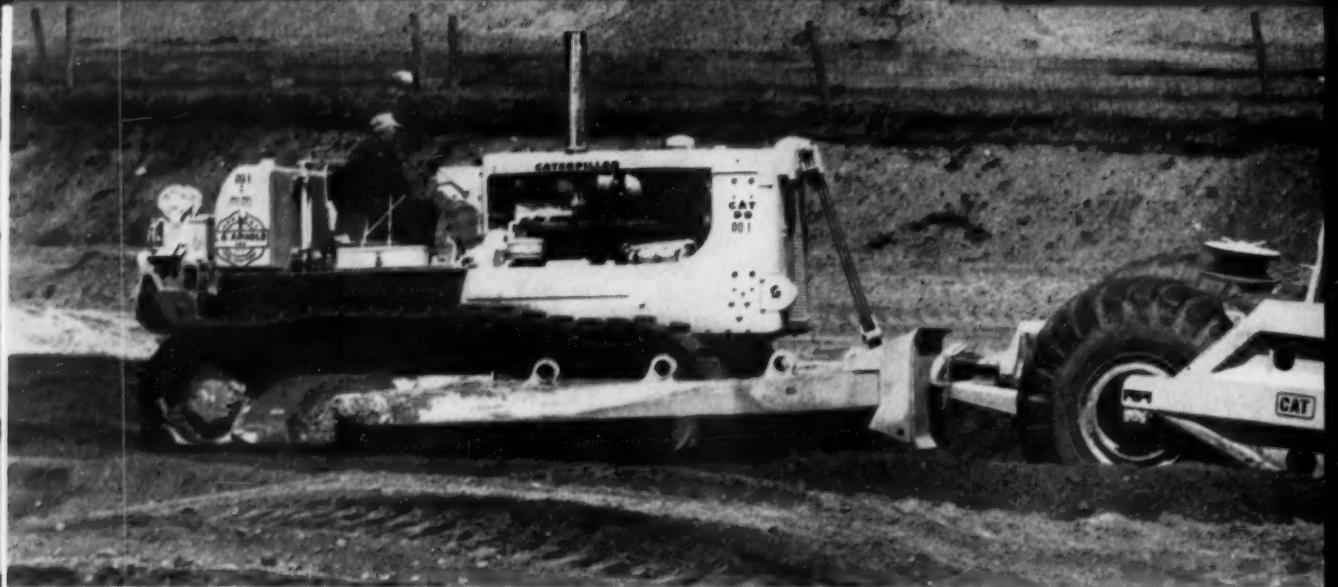
Safway scaffolding helps you solve problems—*save money on EVERY job!* Large or small, difficult or routine, exterior or interior, construction or maintenance—experienced Safway engineers can scaffold your job for complete safety and convenience with economy.

Planning and erection service is offered by 135 Safway offices—including one *near you!* Ample stocks are available for sale or rental. Learn how you can benefit—get recommendations from Safway on your next job. There is no obligation.

Safway Scaffold Advantages

- Safway offers the most complete scaffolding line. Parts for every construction problem are available from stock.
- Safway frames are balanced for easy one-man handling—always important and vital when working in cramped quarters at great heights.
- Safway coupling pins, studs and wing nuts are still the most trouble-free method of assembling scaffolding. For fastest possible erection, Safway Quick-Lock fasteners are also available to permit attaching cross braces with one hand.
- Safway equipment is made from high carbon structural steel tubing . . . constructed by certified Master Welders . . . treated with rust inhibitor . . . finished inside and out in baked enamel.
- Safway originated tubular steel scaffolding . . . offers unequalled experience in its design and application.

SAFWAY
STEEL PRODUCTS, INC.
6243 W. State St., Milwaukee 13, Wis.



DOES THE KING OF THE CRAWLERS PAY ITS WAY?

Let's talk push-loading. We'll use some figures—that's the only way to tell a dollars-and-cents story.

On a job in Munsing, Michigan, not long ago, a Caterpillar D9 Tractor and a competitive machine were both push-loading in moist sand with some gravel in it. The other machine loaded 18.3 cu. yd. in .91 min. That's 20.1 cu. yd. a minute. The D9 pushed 18.5 cu. yd. into the scraper in only .58 min. That's 31.9 cu. yd. a minute. In other words, the D9 loaded over 50% faster than the other machine, and developed a larger load while doing it.

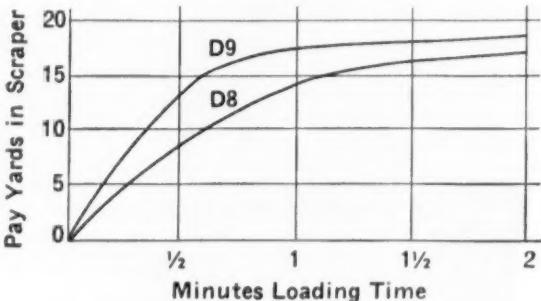
In Belmont, N. C., a D9 and a different competitor were push-loading in sandy clay. The other machine handled 15.3 cu. yd. in .67 min. Or 652 cu. yd. an hour. The D9 handled 17.2 cu. yd. in .42 min. Or 860 cu. yd. an hour. This was a half million cubic yard job; the D9 could have completed it in $3\frac{1}{2}$ weeks less time than the other machine.

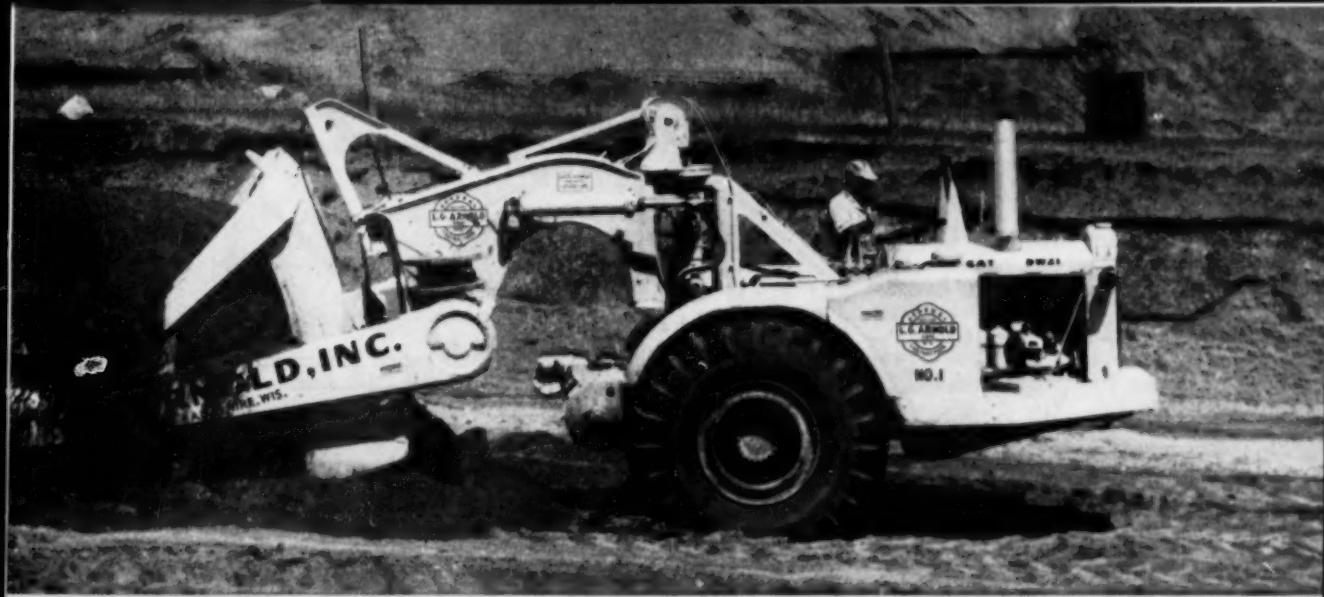
On a job in Minot, N. D., on another in Atlanta, Ga., the story was much the same.

Compare a big yellow machine with another big yellow machine

Maybe the best way to spell out how the D9 can boost profits is to compare its performance not with another make but with this famous CAT* D8 Tractor.

Owners and operators know what the D8 will do. Pound for pound, it's the best-producing crawler in its class today. The D9 is bigger, has more power. Does this added size and power really make a difference? Look what happens when you have a D8 and D9 both pushing DW21-No. 21 units on the same job:





D9 push-loads DW21 with No. 470 Scraper on highway job in Wisconsin. Ten-mile job calls for handling 120,960 yards, mostly sandy gravel. D9 loads DW21 in gravel in 70 seconds here, with heaping loads up to 25

yards. Vice President F. L. Carr of L. G. Arnold, Inc., says, "The D9 pusher has more than lived up to our expectations." Grade Superintendent Phil Dudenhoefer adds, "Outproduces by far any other machines on the job."

Forget size, weight, horsepower. Forget toughness and agility.
These only point to what counts most: out on the job, how does
the D9 really stack up against competition in cost-per-yard?

Or compare these two big yellow machines this way. Say on a job your haul distance averages 1,875 feet and you're using three DW21-No. 21s with one pusher. If that pusher is a D8, you stand to average 344 yards an hour. If it's a D9, you'll get 412.

Now, say your spread is made up of the pusher and the three wheel units, plus a No. 12 Motor Grader and another crawler with 'dozer and roller. Figure your hourly owning and operating cost. Count in the depreciation, taxes, gas and fuel, lube oil, grease, repairs and labor, and operators' wages. If your pusher is a D8, a reasonable figure for the spread would be \$73.52 an hour. If it's a D9, your costs could come to \$77.32. But remember, you're getting 344 yards with the D8, and that comes to 21.4¢ an hour per yard of dirt. With the D9, you're getting 412 yards at \$77.32 an hour—which figures out at 18.7¢ per yard of dirt.

The D9 would save you 2.7¢ per yard, and give you 68 more yards, each and every hour.

Naturally, these figures might not exactly match your own. But they are figures based on actual performance records and they tell an honest story.

Would the D9 make more money for you?

There are jobs that would not warrant a D9. With the rugged D8 available, there may be no need to call in the 29-ton, 320-flywheel-HP D9. But the above figures certainly prove this much: on job after job, the D9 is paying its way, no matter how close the records are kept. One of these jobs could be yours.

But don't just take our figures for it. Call your Caterpillar Dealer. Have him demonstrate the D9 on your job. Check it with *your* watch, in *your* dirt, against *your* books. *That'll* tell the tale.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

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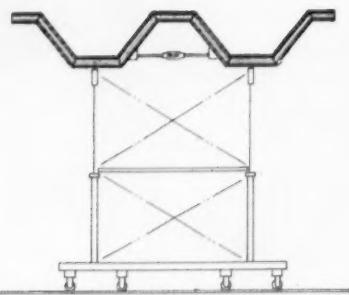
THE D9-
PROFIT BUILDER

How Do You Build Them?

It takes skill and plenty of imagination. Here's how contractors for the first five corrugated roof hangars in U.S. solve the problems.

PROBLEM ONE:

What kind of traveler will lift forms for a pour, then lower them enough to clear slab corrugations?



New Corrugated Roof Hangars

CORRUGATED ROOF HANGARS—current solution of designers to the problem of housing today's giant airplanes—are proving severe tests of contractor ingenuity. There just seems to be no easy way to build the complex roofs.

Up until two years ago, such hangars didn't exist. Now, five are either under construction or completed; and many more are in the planning stage.

What are these hangars? Basically, they consist of two distinct units: an anchor building that also serves as a bent; and two corrugated or thin-shell concrete roofs, cantilevered or cable-suspended on each side.

Roof slabs are only 4 to 5 in. thick. Corrugations run perpendicular to the anchor building like canals 6 to 12 ft deep. These roofs usually are 600 to 800 ft long and 60 to 160 ft wide. For the designer they represent economy (about \$2 psf to build) and a successful method of spanning large areas without columns. But for the contractor, they're a collection of headaches.

Biggest headache is finding some economical way to form and pour the roofs. The cost of building rigid falsework to support forms for the entire roof is prohibitive. Some sort of traveler is called for. But building a satisfactory traveler is a complex and

expensive business because it must be designed to lift and lower forms at least 6 ft to clear corrugations.

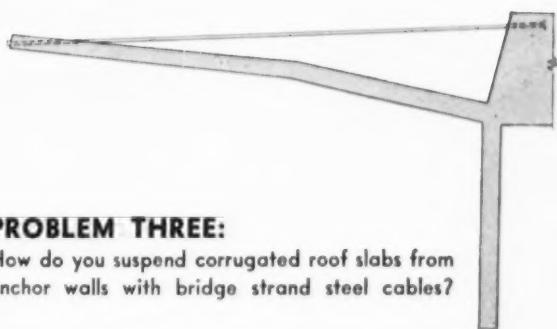
Another problem is concreting. Steep sloping sides of the corrugations cause concrete to slip down and puddle at low points before it sets enough to support itself. The contractor has to find some way to hold concrete temporarily in place on form sides during vibrating and screeding.

Finally, for suspended roofs, some effective method has to be found by which roofs might be hung by bridge cables.

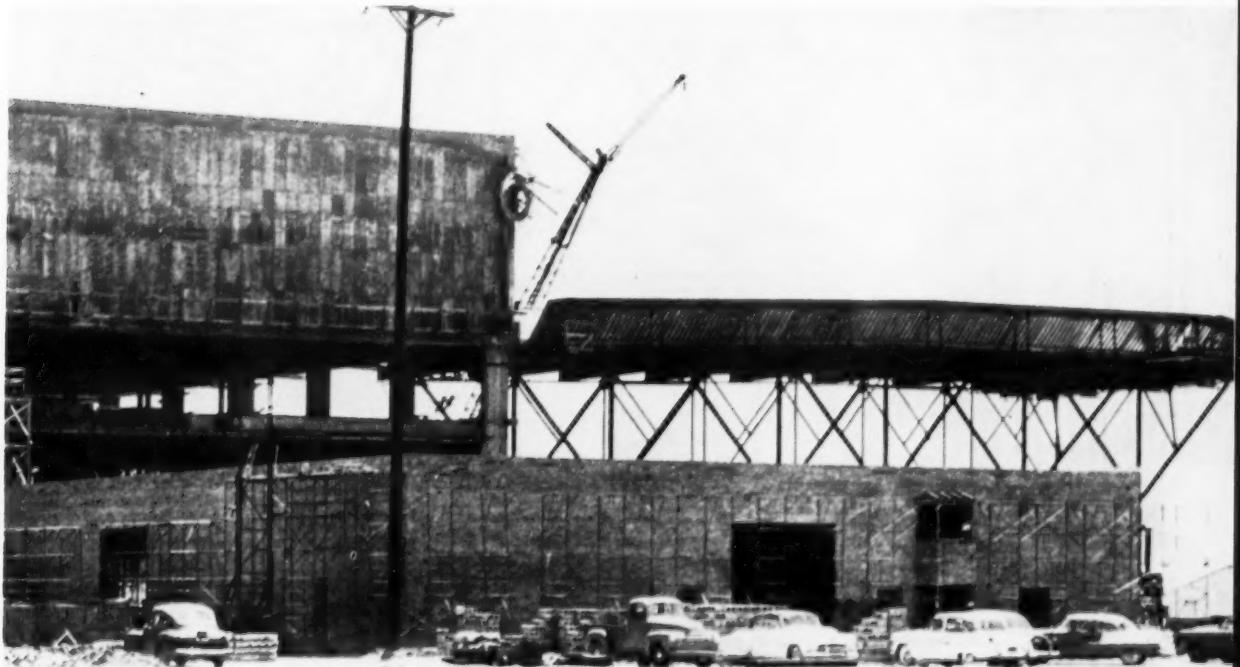
First of the hangar contracts two years ago went to MacDonald-Creighton, a joint venture

**PROBLEM TWO:**

How do you keep concrete from puddling down the smooth, sloping sides of the forms?

**PROBLEM THREE:**

How do you suspend corrugated roof slabs from anchor walls with bridge strand steel cables?



Challenge Skill of Builders

contractor. The job was a suspended-roof hangar for Trans-World Airlines at the Mid-Continent International Airport in Kansas City, Mo.

The hangar is a 400x800-ft structure with a 100-ft-wide center building and a 150-ft-wide cable suspended corrugated roof on each side of the anchor structure. Roofs here are suspended by cables from 28 concrete bents 30 ft high and spaced 30 ft apart in parallel rows along the length of the anchor building.

Six months later, Fred Howland, Inc., of Miami started a cantilevered corrugated roof hangar for National Airlines at Miami International Airport. Though

Howland escaped the suspension problems, 12-ft-deep corrugations on this roof multiplied his forming and concreting problems.

Two suspended roof hangars next were started almost simultaneously and right alongside each other a year ago at New York's International Airport. The first, awarded to New York's Grove, Shephard, Wilson & Kruege, Inc., is a \$10-million, 400x800-ft hangar for Trans-World Airlines.

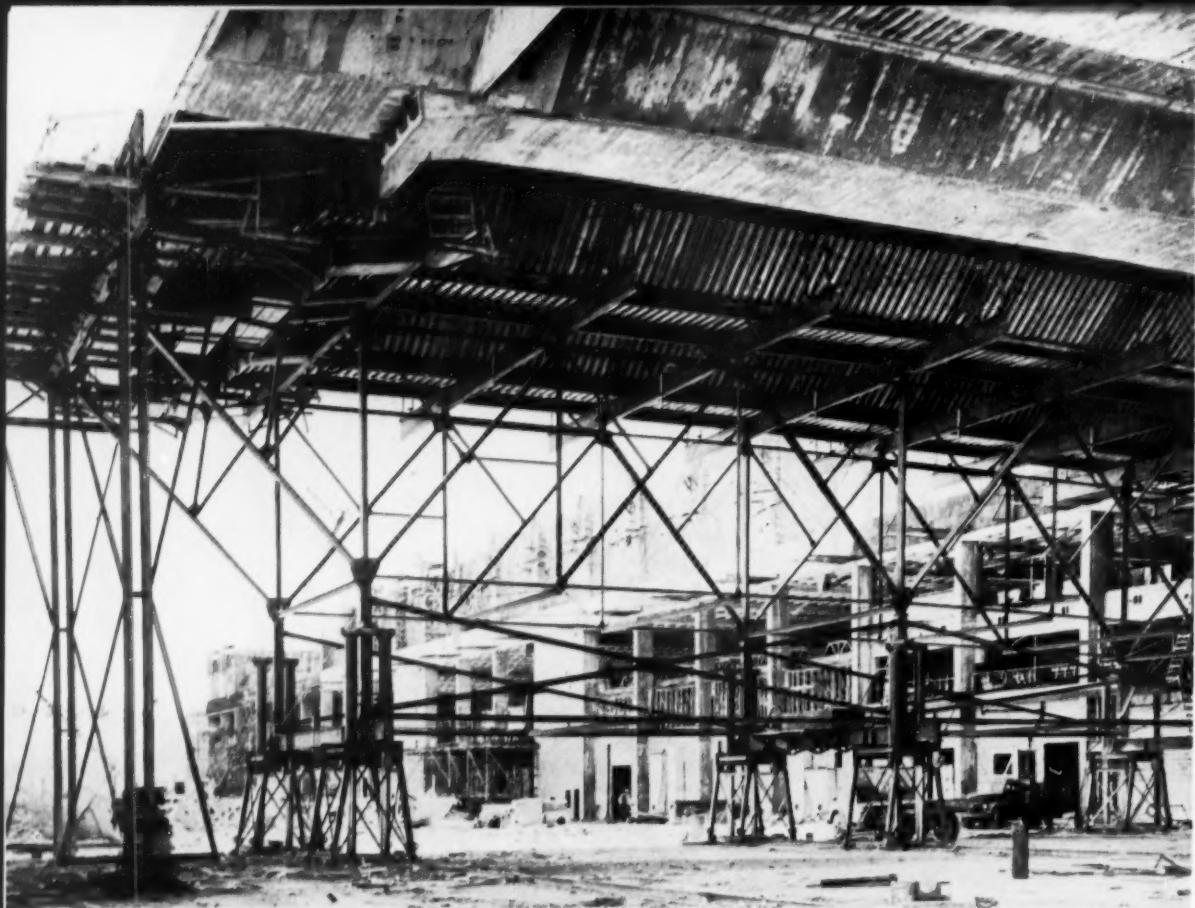
Corbetta Construction Co. of New York landed the contract for the other, a \$12-million hangar for Pan American World Airlines. Both the Grove and Corbetta jobs are about at the mid-way point.

Last of the five, now only in the anchor building stage of construction, is a cantilevered roof hangar that Thompson Construction Co. of Albany, N. Y., is building for Oneida County Airport in Utica, N. Y. The hangar will be used by Mohawk Airlines.

The Answers

This Construction Methods report will bring you up to date on how contractors are meeting the problems of building these roofs. Three sections compare: (1) Form traveler methods; (2) Concreting methods; (3) Jacking of roof cables that will suspend the corrugated concrete roofs.

continued on next page



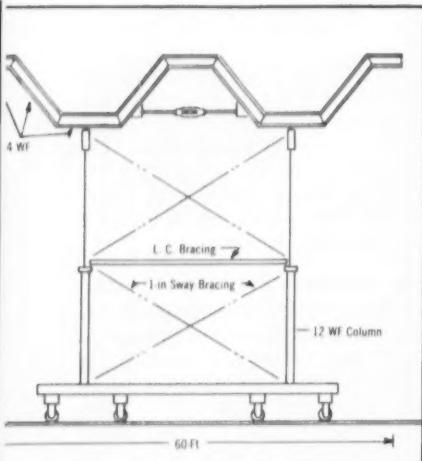
STEEL TRUSSES AND STEEL FORMS—MacDonald-Creighton forms for corrugated roofs on a TWA hangar in Kansas City are steel

forms built over a traveler of steel trusses supported on steel posts and jacking chairs. These sit over steel rails for moving.

ROOF HANGARS . . . continued

SOLVING PROBLEM ONE:

Contractors Build Ingenious Travelers



RIDES ON RAILS—Wheels fitted to bottom of traveler move it to next pour site.

EACH OF THE FIVE contractors showed imagination in building a traveler to meet the requirements of his job.

Two steel falsework travelers were MacDonald-Creighton's answer to the problem of supporting roof forms on the Kansas City job. Each handled a 60x150-ft section of suspended roof. The travelers were built especially for the job by Havens Structural Steel Co. of Kansas City.

Two steel trusses spaced 30 ft apart extended the 150-ft width of the roof. Main crossbeams of 24-in. WF beams spanned the trusses and cantilevered 15 ft over on each side.

In position for rolling, the traveler sat on flanged wheels that

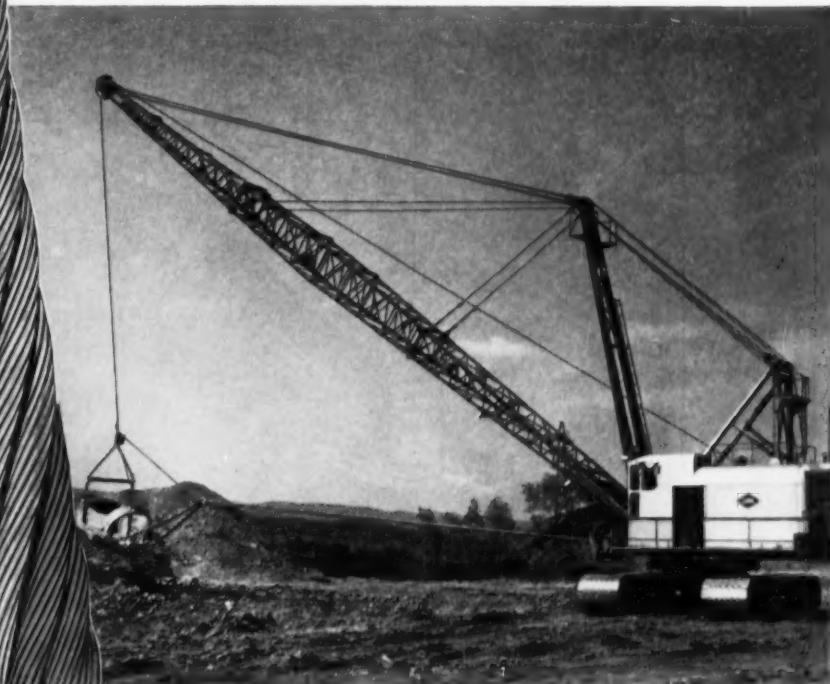
rode three rails laid on the floor of the hangar. Pairs of Rotary Lift hydraulic jacks under three points of each of the posts raised the traveler into place. These jacks could raise the traveler as much as 8 ft in a single lift. But minimum vertical travel actually required to clear the corrugations was just under 6 ft.

Jacks were not designed to carry the load of roof concrete; their purpose was only to raise the traveler. To take the concrete load, steel columns were pinned to the vertical legs of the traveler and set on the ground. Jack pressure then was released and the columns took over support of the falsework. A crew of 10 men raised, lowered, and moved the

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ROOF HANGARS ... continued

traveler from one position to another. A complete move was made in an 8-hr shift.

Tubular Scaffolds Supplement Traveler

The traveler worked fine for M-C, but a plague of labor difficulties in the area began throwing the job off schedule at an early stage. To make up the lost time, M-C supplemented the travelers with two sets of tubular scaffolding falsework to support the forms. These were put into action starting from the opposite end of the hangar and advancing towards the travelers.

The falsework was a forest of Beaver-Advance scaffold towers that rose more than 40 ft and supported $\frac{3}{4}$ -in. plywood facing backed by 2x4-in. frames. Trussed timber framework on top of the tubular steel scaffolding supported the form panels.

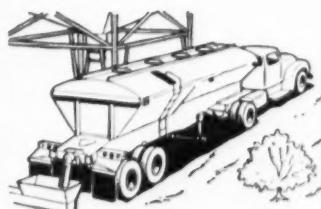
Though more difficult to move than the travelers, the system was lowered with surprising speed. When hinged plywood forms were dropped from under the pour, the scaffolding was lowered by screw jacks so that the entire section could be moved ahead on pipe rollers to the next position, then jacked up into place. More than 5,000 tubular steel scaffold bents were used in this method.

Forms for the truss-type travelers were Mahon steel forms that rested on 10-in. WF trusses assembled over the traveler to the shape of the corrugations.

continued on next page



There's a Trailmobile trailer for every construction need



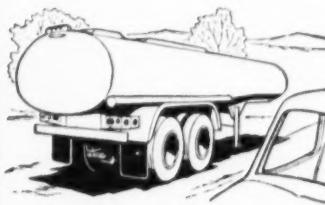
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... transport large amounts of bulk cement to mixing plants at the job site. Both steel and aluminum types offer exclusive step-down design with twin screw discharge.



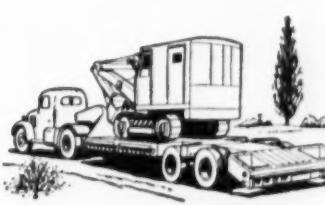
TRAILMOBILE HYDRAULIC DUMPS

... provide big capacity in a dump-type trailer for hauling and unloading sand and gravel. Unusually rugged construction guards against costly out-of-service time.



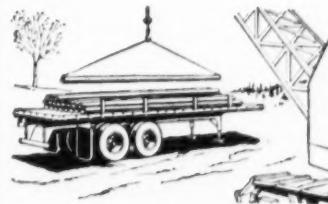
TRAILMOBILE TANK TRAILERS

... are widely used for hauling hot asphalt, road oils, and the great volume of water required at the site. Most units carry a unique guarantee against tank leakage.



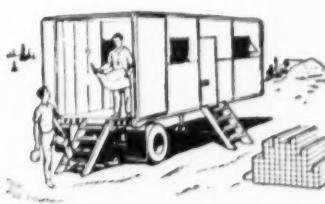
TRAILMOBILE LOW BEDS

... are used to deliver heavy road building equipment to the job area. Steel shovels, bull dozers and other large tractor-treaded units can be easily transported on these powerfully built trailers.



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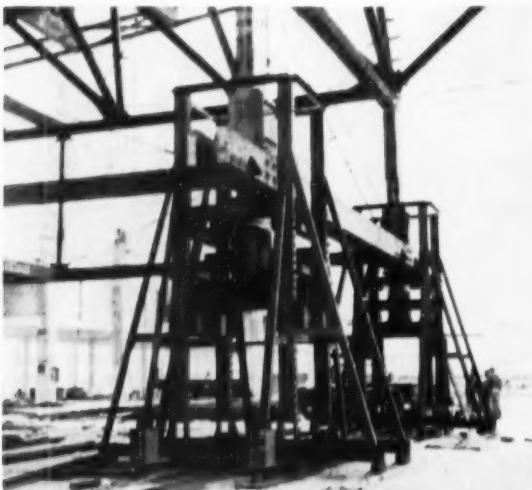
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ROOF HANGARS . . .

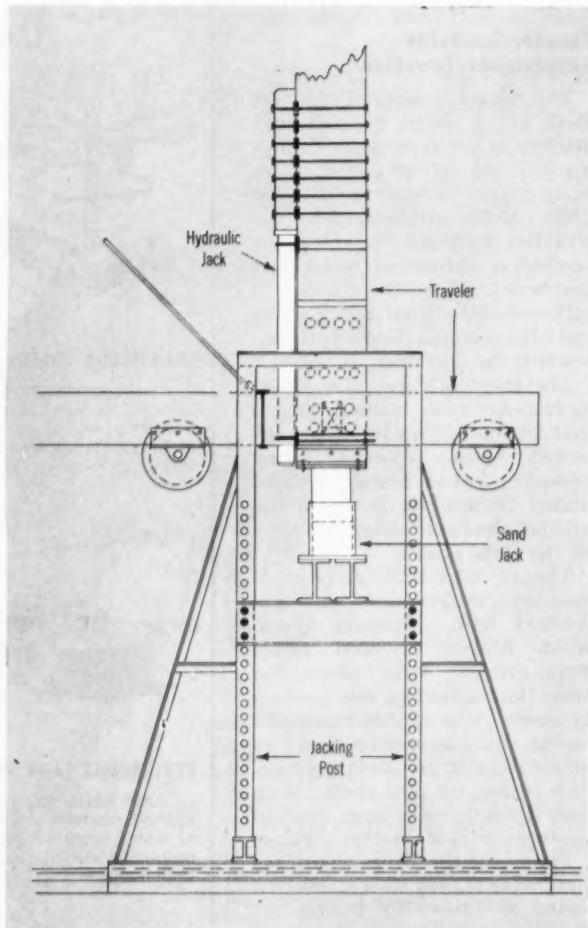
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TWO-LIFT JACKING—Traveler twice is raised 6 ft by hydraulic jacks. Sand jacks hold traveler between lifts and during pour.



FOUR POSTS SUPPORT TRUSSES—Roof is a true cantilever with a span of only 60 ft. It requires only four posts for support.



SAND JACK DECENTERS FORM—Sand released from sand jack spout lowers form several inches. Hydraulic jacks complete lowering.

In Miami—A New Development

Corrugations 12 ft deep on the Miami job (started 6 mos after the K.C. job) gave Fred Howland, Inc., added problems. Though able to borrow the truss-type traveler concept, Howland had to figure out a way to raise and lower the traveler the necessary 12 ft to clear corrugations.

Howland ordered four travelers specially designed and built for the job by Timber Structures, Inc., of Ramsey, N. J. Principal members of these travelers are laminated wood so that they are light and easy to move.

Each supports a 60x60-ft section of roof forms. A traveler consists of two laminated timber

trusses that run from the anchor building to the roof tip. They are spaced 32 ft apart. Stringers made from 7x13-in. laminated sections span the trusses on 12-ft centers and extend out 14 ft from each side.

Four 11x22-in. laminated vertical posts under the trusses at quarter points are rigidly cross-braced by $\frac{1}{8}$ -in. steel rods threaded at each end to receive turnbuckles.

Each post is set over a steel jacking chair that serves two purposes: (1) When the form is in position, the chair supports the load of concrete as well as the forms; (2) It permits two 6-ft

lifts of the traveler to clear corrugations.

The chair consists of four nearly vertical steel posts 14 ft high that are perforated to receive jacking pins. Two steel cross braces connect the post on two sides at the bottom of the chair.

Two additional pieces of steel beam are placed crossways over the first two braces. They seat a sand jack on top of which a vertical post of the traveler rests.

(The sand jack has two basic parts: a cylinder and a steel piston. A non-moisture absorbing pure silicon Ottawa sand is packed into a cylinder. This serves as the compression mem-

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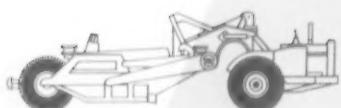
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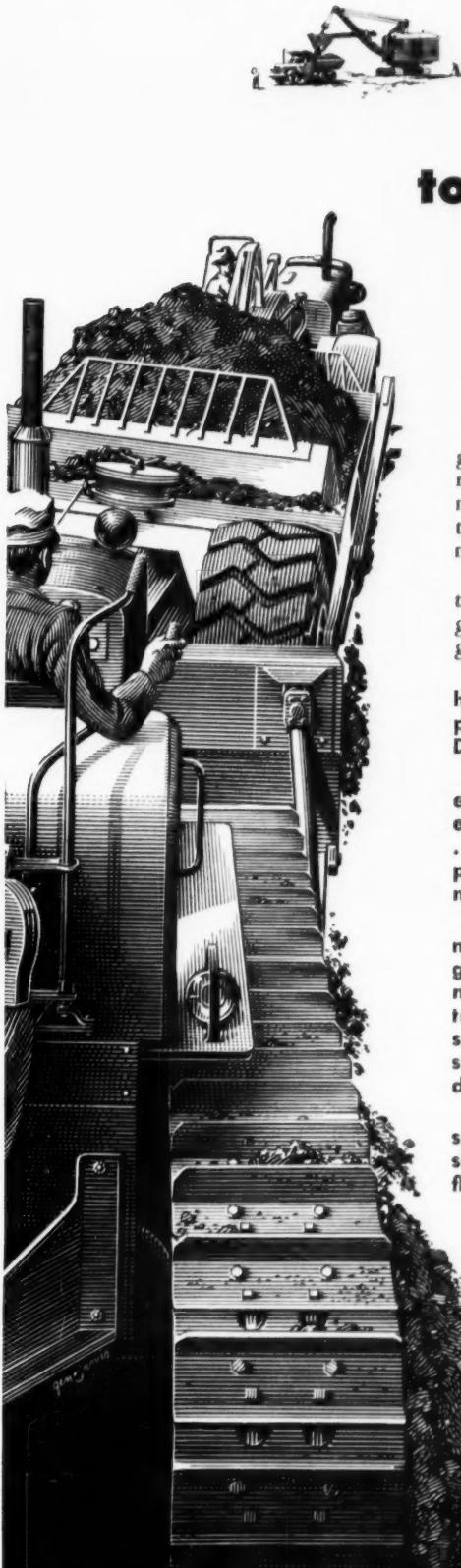
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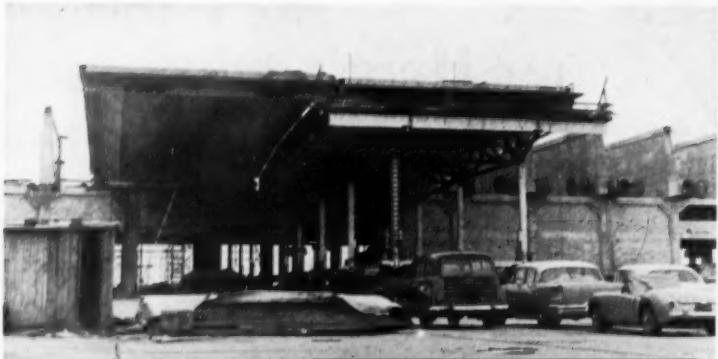
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ROOF HANGARS... continued



EIGHT POSTS CARRY THIS TRAVELER—Post-supported truss concept undergoes improvement for a hangar at New York airport. Longer span requires eight posts though only one lift.

ber. The piston is set over the sand. To lower the jack, sand is run out from the cylinder by removing a threaded bolt at its bottom.

A third brace along one side of the frame seats a 35-ton, 4½-in. I.D., 6-ft-stroke hydraulic jack with a double-acting cylinder. The jack's ram comes up under a jacking seat on the post.

The hydraulic jacks lift the

traveler 6 ft. While the traveler is suspended, cribbing and sand jacks are moved up and pinned to the jacking posts. Each hydraulic jack then is released slightly bringing the posts back to rest on top the sand jacks.

Unit Moves Up

Next, hydraulic jacks are moved up on cribbing and the traveler again is lifted 6 ft. Once

more sand jacks and cribbing are moved up, and the entire load of the traveler comes to rest on sand jacks and chairs.

The sand jacks play a major role in initial stripping operations. Bond between forms and slab has to be broken carefully to prevent damage to either traveler or slab. This is done by letting sand pour slowly out of the jack, bringing the form traveler down several inches. Workmen then check clearances to make certain bond has been broken before further lowering is done.

When the traveler has been brought free of the slab by the sand jacks, the load is transferred to the hydraulic jacks, and the sand jacks are moved down 6 ft. The hydraulic jacks bring the traveler down to the tracks in two 6-ft drops. A tractor pulls the traveler to its new location by cable.

Roof forms, fabricated from $\frac{7}{8}$ -in. plywood panels, were assembled on top each traveler to the shape of the corrugations.

continued on page 137



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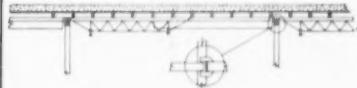
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Page 6. Spanall installs fast and easy.



Page 5. Spanall applies to any type of poured concrete construction.

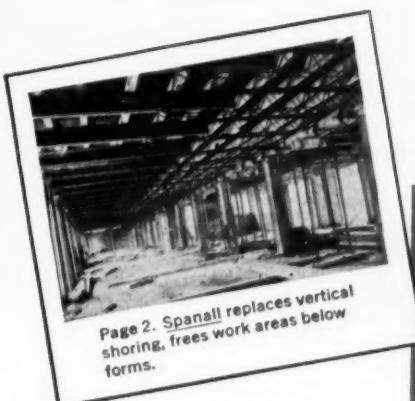


Page 7. Plywood decking laid directly on Spanall.

Newest Catalog features new way to save time, cut costs

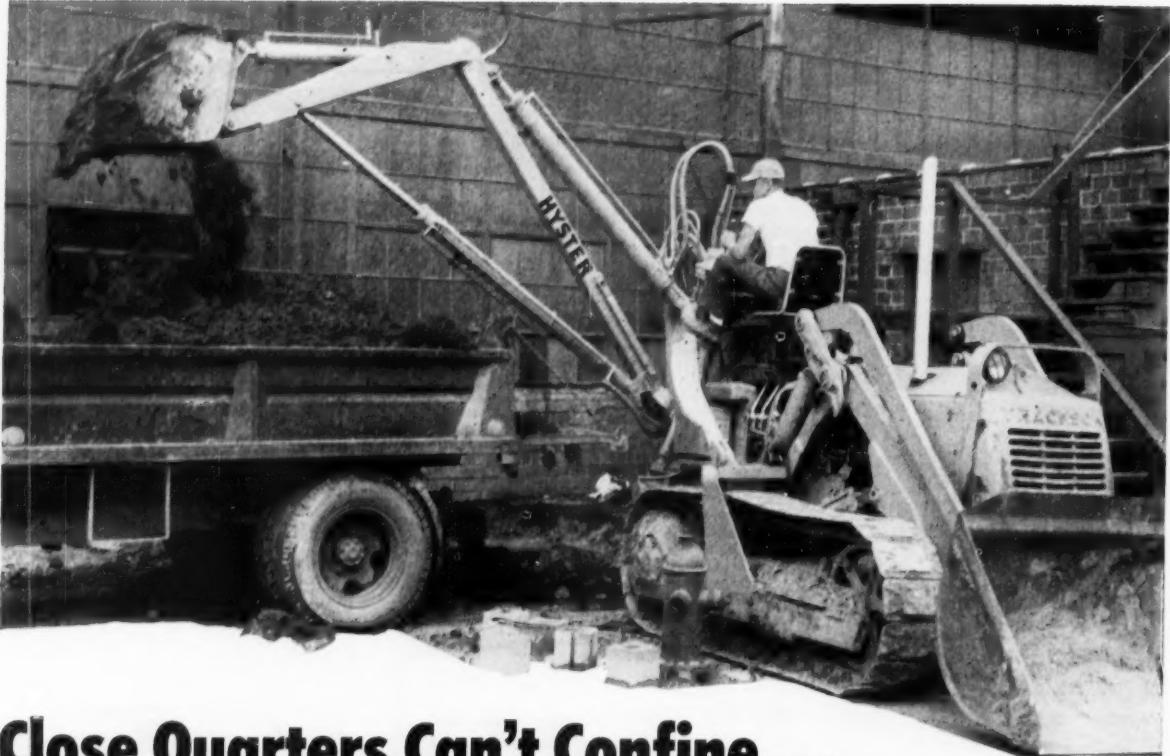
Here is practical, profitable information about Spanall, the popular, new, all-metal Horizontal Shoring for concrete forms. Photos, charts and drawings clearly illustrate how Spanall is erected, stripped and stored—with new ease and speed...how Spanall adjusts quickly to any required span length—how Spanall forever eliminates cumbersome, costly vertical shoring...and actually saves as much as 40% in both time and money.

Get all the facts about Spanall—it could provide just the competitive advantage you'll need for 1957.



Page 2. Spanall replaces vertical shoring, frees work areas below forms.

P R O C K E N G L A M B C D	SPANALL OF THE AMERICAS, INC. 787 United Nations Plaza, New York 17, N.Y. Gentlemen—Please send, without cost or obligation, _____ copies of the new Spanall Catalog.
NAME _____	POSITION _____
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Close Quarters Can't Confine... the HYSTER D4 HYDRAULIC BACKHOE

HYSTER COMPANY

D4 BACKHOE MAKES MORE
JOBS "ONE MACHINE" JOBS

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Peoria, Illinois
Nijmegen, The Netherlands



- Simultaneous hoist-and-swing.
- Full digging power anywhere within the 240° swing arc.
- Unobstructed operator visibility.

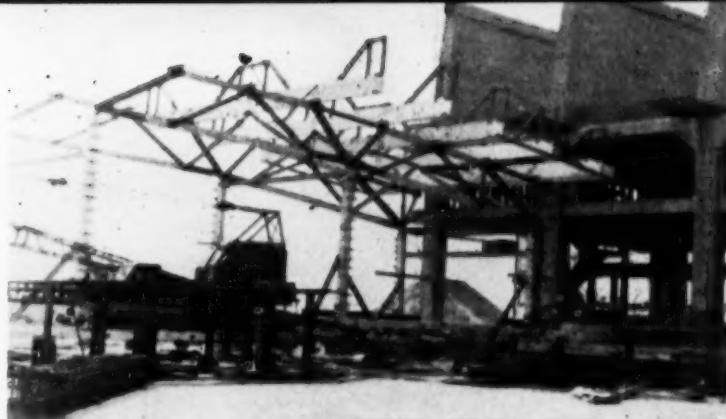
These PERFORMANCE FEATURES make this job "routine" for the backhoe in spite of obstacles restricting operating space at this crowded industrial site.

Match these ADDITIONAL PERFORMANCE FEATURES to your own job requirements, and you will understand why more and more contractors are making use of the dependable, low-cost power of the D4 Backhoe to cut operating costs and step up production.

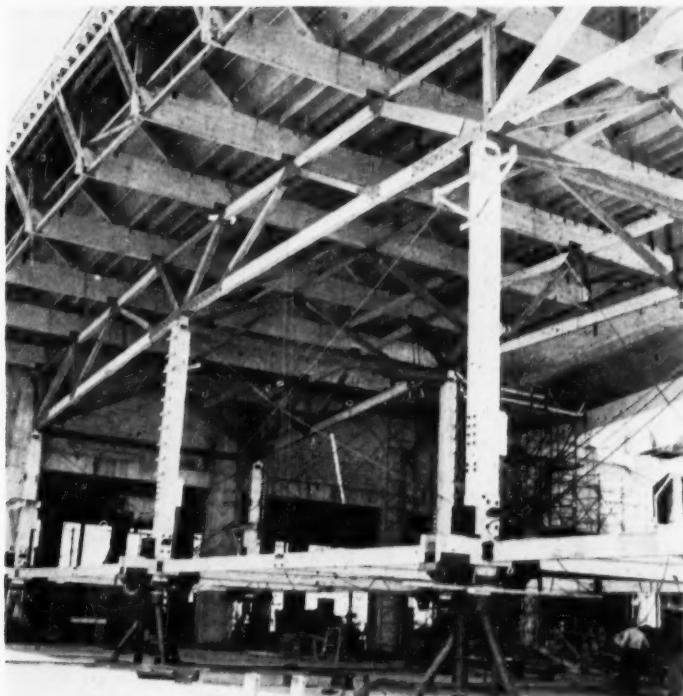
	On D4 Tractor	On 955 Traxcavator	On HT4 Traxcavator
Maximum Reach From Tractor Rear Sprocket	20'4"	20'9"	20'11"
Maximum Digging Depth	13'	12'3"	12'9"
Clearance at Beginning of Dump	9'7"	10'3"	9'9"
Clearance at End of Dump	14'9"	15'5"	14'11"
Dipper Wrist Action	104°	104°	104°

4 Tons of Tooth Force • Track-type Tractor Mobility
Combination Hoe and Heavy-duty Bulldozer

In New York— Progress From Experience



ASSEMBLING TRAVELER—Grove, Shephard, Wilson & Kruge of New York adapt traveler (shown being assembled) similar to Miami's to build hanger at New York's Idlewild Field.



JACKS ARE SIMPLER—Where in Miami sand jacks had to be placed on jacking chair, jacks on Grove job become part of chair. Jacking unit must be moved before traveler is lowered.

A simplified sand jack support is the standout performer on a similar traveler—also built by Timber Structures—now in use by Grove, Shephard, Wilson & Kruge, on the TWA hangar at New York International Airport. Grove uses four travelers each with eight vertical posts. Each supports a 60x150-ft section of roof.

This traveler, like the one used in Miami, consists of two laminated timber trusses set over eight 14x16-in. laminated timber posts. Crossbeams of 24-in. timber and steel rods brace the posts.

In position for rolling, the traveler sits on flanged wheels that

ride four rails on the hangar's concrete deck. Eight individually actuated 20-ton hydraulic jacks raise the traveler the required 6 ft and hold it in place until a sand jack and chair can be slipped under each vertical post. Hydraulic jacks then are retracted, and the sand jacks take the load.

Forms for the roof corrugations consist of $\frac{3}{4}$ -in. coated plywood panels assembled on top the traveler. Stripping is the same as in the Miami job. Grove uses a crane to pull the traveler to its next pour position.

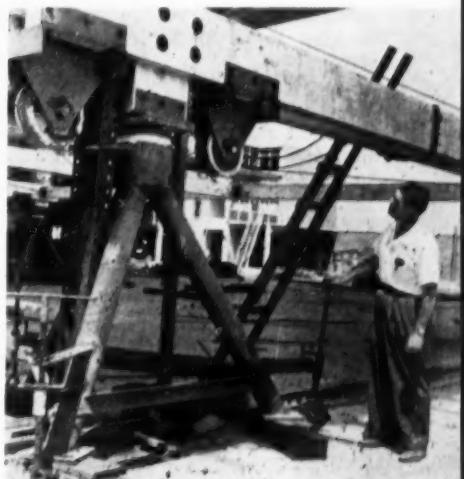
A complete departure from previously used methods marks Corbett's Construction Co.'s ap-

proach to a form traveler. This is a piggy-back traveler (CM&E, June, 1957, p. 107) dreamed up by Corbett's Executive Vice President Charles Prokop. It consists of two timber framework right-angle wedges placed over one another so that the thick portion of the top wedge rides over the thin portion of the bottom wedge in piggy-back fashion.

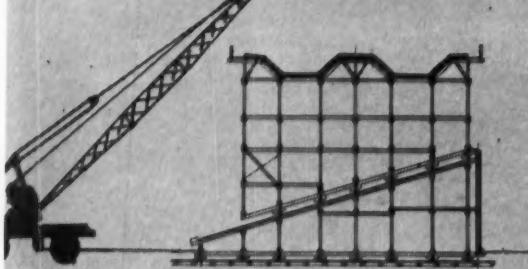
By simply pulling the bottom wedge out, the upper wedge drops down vertically far enough to free the forms from under the slab and clear the corrugations. Pulling the top wedge back on top of the lower wedge resets the traveler for another pour.

Reason for the change? Corbett's forces believed other forms of travelers used to be non-salvageable. They can be used only for the job for which they were designed, or only on a job of identical roof span and design.

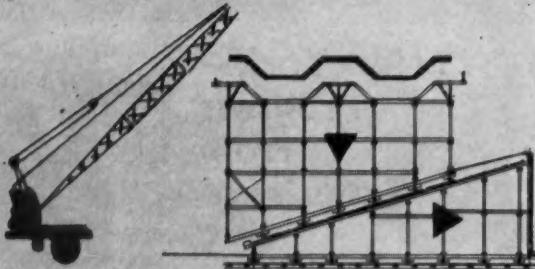
Though the Corbett travelers cost almost as much to build, they



RAISED AND READY—Superintendent checks traveler jacks before pour begins.

This is the Piggy-Back Traveler . . .

TO POUR SLAB — Traveler held rigid by jacks supports slab forms while roof concrete is being poured. Concrete cures for seven days.



TO STRIP SLAB — Bottom wedge of traveler is pulled out. This causes the top wedge to drop vertically, clearing forms from corrugations.

A SHORT DISTANCE AWAY—Corbetta Construction Co., building a hangar for Pan-American World Airlines, devised a piggy-back

traveler to place and strip forms. Corbetta's traveler is a complete departure from travelers used previously.

are as easy to operate, and the salvage value of the timber after the job is finished makes them less expensive in the long run, the company says.

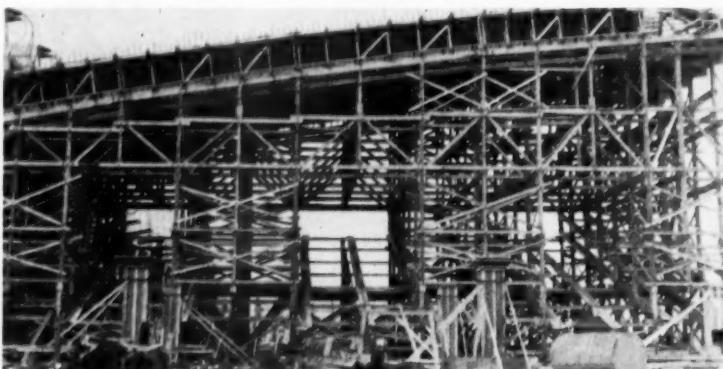
Roof slabs on this job are only 4½ in. thick. Corrugations run 6 ft deep and 30 ft wide. The roof stands 36½ ft above ground at the anchor building and rakes up to 63½ ft above ground at the outboard edge.

Corbetta's traveler measures 135 ft wide, 163 ft long, and stands three-stories high. The contractor uses four such two-wedge units. Each wedge is made up of a series of timber trusses connected by cross-braces. Wheel and jack assemblies anchor the wedges during a pour or permit moving them to the next pour site.

Each bottom wedge is fitted at the bottom of its upright posts with wheel assemblies. Intermediate posts extend down between the wheeled ones 6 in. below the bottom of the truss chord.

Four rails run up the slanted side of the bottom wedge over which the top wedge rides. Near the foot of each rail, a curved plate is welded to arrest the upper wedge during stripping operations.

The bottom wedge is jacked up until its wheels clear the tracks. Wood shims then are jammed under the extended posts and hammered home. The top wedge is jacked up off the rails.



A FOREST UNDERNEATH—Thousands of board feet of salvageable lumber means

economy in the use of this traveler as compared to other equally expensive units.

Two control devices prevent the bottom wedge of the traveler from running loose during stripping and insure that the upper wedge drops vertically.

A cable sling is run around the bottom wedge and out to a crane. As the bottom wedge backs out, the crane moves in to control the speed of the wedge movement.

To insure that the top wedge drops vertically, a cable is run out from the center point of the upper wedge, through a sheave at the top of the lower wedge, down to another sheave at the bottom of the lower wedge, and out several hundred feet to a deadman. The cable remains taut as the bottom wedge moves out; only the angle of the top sheave changes as the wedge moves.

For stripping, workmen retract the jacks carrying the upper

wedge so that its wheels come in contact with the rails. Shims supporting the lower wedge are knocked out bringing its legs down into contact with the rails.

The weight of the upper wedge, pushing down on the lower wedge, forces it to move outward while the upper wedge moves down. The crane bearing the arrester cable moves in slowly, controlling the rate of speed of the lower wedge. When the lower wedge moves out so that the upper wedge comes to a stop at the moved to the next pour position.

There the cable secured to the deadman is reset in a new position. The crane backs up, forcing the upper wedge back up over the lower wedge. Resetting jacks and placing shims readies traveler.

continued on page 141



Wherever Power is on the move...

INDUSTRY DEPENDS ON **ILLINOIS GEAR**



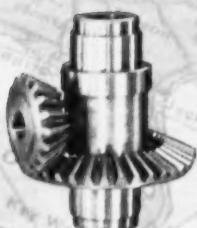
Throughout the world . . . wherever power is on the move . . . ILLINOIS GEARS are delivering this power dependably year in and year out.

Whether it is in machine tools, steel mills, cement mills, paper mills, chemical plants, construction equipment . . . machinery of any kind . . . this dependability, proven by performance, means true economy that has resulted in enduring customer satisfaction.



When you need gears—remember this: ILLINOIS GEAR manufactures the most complete line of quality gears in the world.

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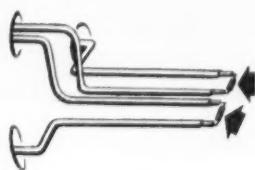
Introducing the new...



All-Glass C.I.M. Floodlamp

for Construction and Industrial Machinery

LONGER SERVICE LIFE—New C.I.M. Floodlamp is designed for rough duty on such equipment as bulldozers, graders, scrapers, crawlers and other road-building, mining and construction machinery.

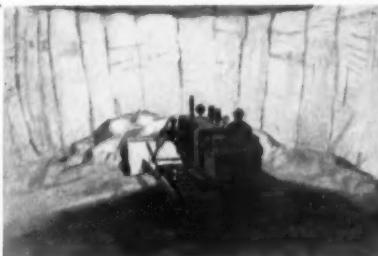


G-E's new C.I.M. Floodlamp features two single coil filaments in series, instead of one. They are shorter, so they have extra strength. Available in 12 and 24-volt.



The sturdy filaments in these new floodlamps are not welded to the lead-in wires. Instead, they are clamped in a vise-like grip for added resistance to breakage.

BEAM DESIGNED TO FIT THE JOB—Lens-reflector combination is designed to give a broader beam spread—vertically and horizontally. You get more light right where you want it.



Vertically, the beam gives more light to illuminate the entire work area.



Horizontally, the beam pattern is smooth . . . you get a more even distribution of light around the machines.

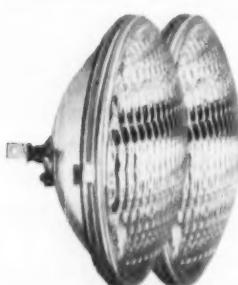
DOES NOT GROW DIM—G-E C.I.M. Floodlamps are all glass, one-piece units . . . so air, dirt and moisture can't get in. Reflectors never need cleaning.



And because these lamps have a hard glass reflector fused to a hard glass lens, they won't crack from splattering by rain or snow.



G-E C.I.M. Floodlamps have no inner bulb to blackout; the whole unit is a bulb. No gaskets to leak, filaments stay in focus.



SPECIFICATIONS FOR G-E C.I.M. FLOODLAMPS (PAR-46 Bulbs—2 contact lugs)

G-E No.	Circuit Volts	Watts	Bulb Dia.	Designed Life
4078	6	50	5 3/4"	500 hours
4478	12	60	5 3/4"	500 hours
4578	24	60	5 3/4"	500 hours

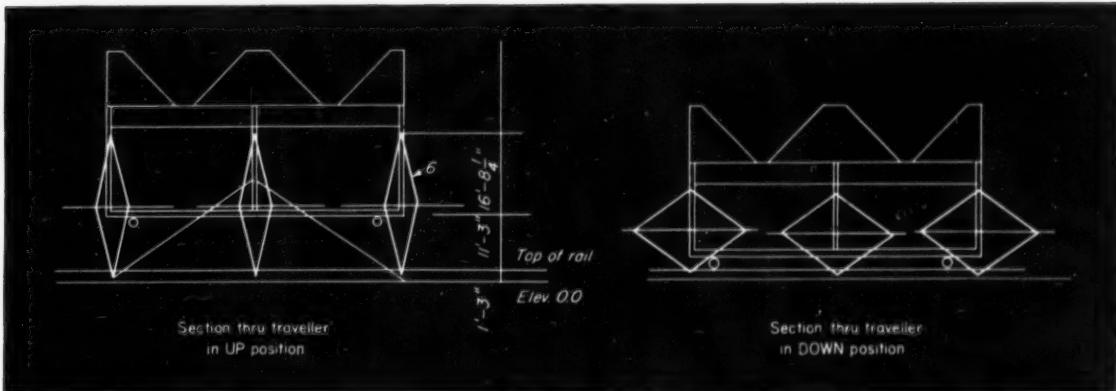
For best results, lamps should be used in shock-mounted housings. General Electric makes a full

line of all-glass sealed beam lamps for construction and industrial machinery. For more information, contact your nearby G-E Lamp Distributor or write: General Electric Co., Miniature Lamp Dept. CME-97, Nela Park, Cleveland 12, Ohio.

Progress Is Our Most Important Product

GENERAL ELECTRIC

ROOF HANGARS ... continued



SCISSOR JACKS RAISE FORMS—Scissor jacks support the form-bearing trusses at Oneida County airport hangar job in Utica.

Squeezing jacks together raises the forms; retracting them lowers the forms. No additional support is necessary for pour.

In Utica—A Brand New Idea

Scissor jacks will raise and lower travelers that will be used by Thompson Construction Co. of Albany, N. Y., to build a cantilevered roof hangar at Oneida Field.

Roofs on this job will be of lightweight concrete and will cantilever out 120 ft on each side of a 48x300-ft concrete anchor building.

Corrugations on 30-ft centers will be 4 in. thick at the tip, increasing in stages to 5½ in. at the root. Overall depth of corrugations at the tip is 3 ft; at the root, 11 ft.

The roof will be poured to the full width of the roof in 60x120 ft sections. Opposite roof sections are planned for simultaneous decentering. Five 60-ft sections will go on each side of the concrete anchor building.

Truss System

The travelers that will support the roof forms were designed and built by Cartwright & Morrison of Holcomb, N. Y. Each traveler carries roof forms on three wood trusses 120 ft long on 29-ft centers with transverse trusses on 5-ft centers forming the corrugations. Plywood on 2-in. wood lagging provides the form surface. Forms here also will be plastic-coated to ease stripping.

Four pairs of scissors jacks under each long truss will raise the traveler to its pouring position. When the form is in position, these jacks also will carry the concrete load. This is one of the jacks' more important benefits.

Each jack is a pin-connected parallelogram with a horizontal threaded rod between the two center pins. Jacks are arranged in cross-braced pairs on 10-ft centers.

Jacks Rise 28 Ft.

In the "up" position, the jacks stand 28 ft from top to bottom with a 6-ft spread at the center where the threaded control rod is located. In the "down" position, the jacks lower forms more than enough to clear the deepest corrugations. Heaviest load on a pair of jacks will be 60 tons. (A full-scale test under 80 tons actual load showed no measurable deflection).

As soon as forms are decentered, the jacks will carry only the dead load of the form thus reducing the load on a pair of jacks to only 5 tons. When the traveler is fully lowered, and its wheels have landed on the rails over which it will be moved, the feet of the jacks will be picked up and hung on cross braces of the traveler.

Posts Reduce Load

Vertical telescopic posts under the three main trusses reduce the load on the jacks. Each post consists of a 12-in. WF beam sliding between two vertical 10-in. channels. These channels are braced and guyed.

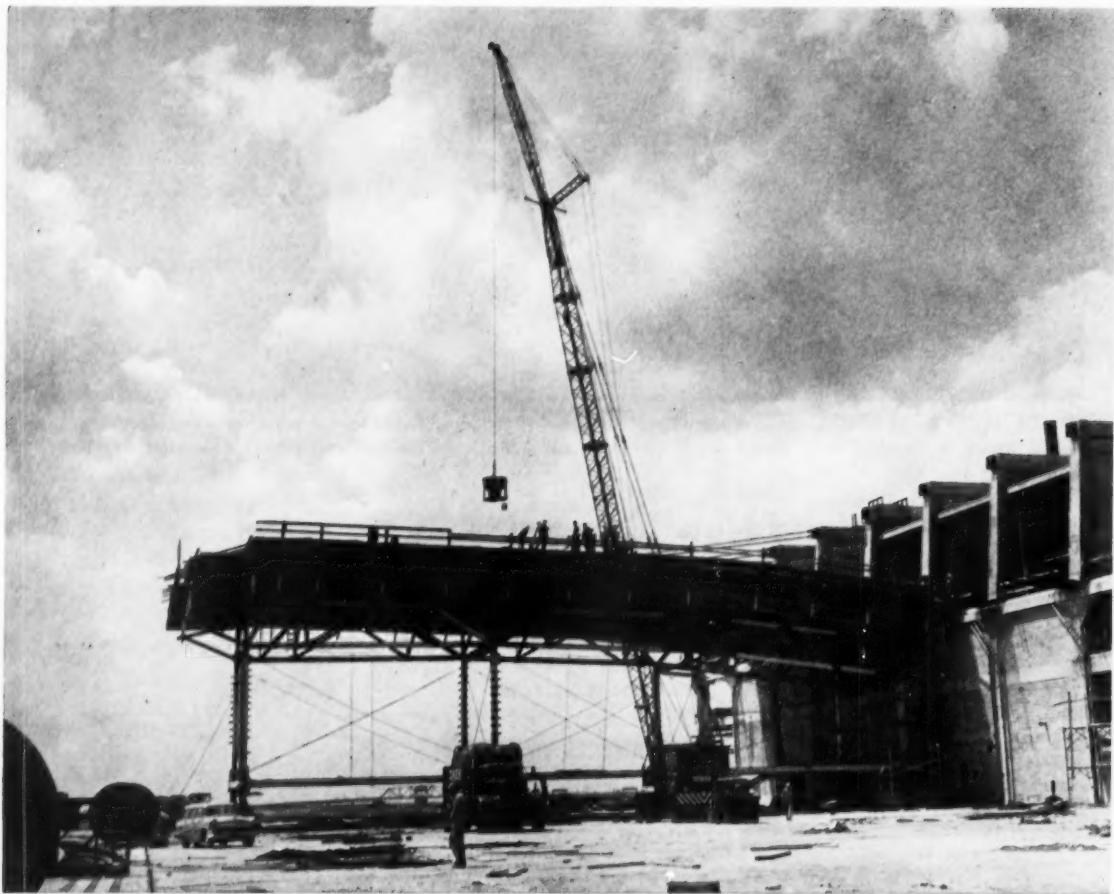
Specifications call for 4,000-psi lightweight concrete for the roof with decentering permitted when concrete reaches 2,500 psi.

continued on next page



READY TO GO—Scissor jack is given dry run before going to work on corrugated roof.

ROOF HANGARS . . . continued



ON THE GROVE JOB—The contractor lifts concrete to roof height by crane and bucket and dumps it over a wood ladder arrangement

placed over the form face to keep concrete from slipping down sloping form sides. Ladder is removed after concrete sets.

SOLVING PROBLEM TWO:

Contractors Devise Concreting Methods

HOW DO YOU keep concrete from slipping down the sloping sides of the forms? That problem hit each of the five contractors with varying degrees of intensity.

On the Kansas City job, corrugations rose only 6 ft and raked upward at about a 45-deg angle for the length of each corrugation. MacDonald-Creighton poured Haydite concrete by crane and bucket. Concrete was dumped into a hopper on the roof and transported to placing areas by four Whiteman concrete Power Buggies.

To keep concrete from puddling down the slopes of the corrugated roof sections, the contractor built a moveable top form faced with fine wire mesh that he called a "mule." Each mule was 12 ft long



ON THE CORBETTA JOB—A miniature canal paver rides on rails on the forms. Concrete pours slowly through baffles on the leading edge of the machine that holds concrete up.

TEAMMED TO OUTPERFORM

IN EVERY AUSTIN-WESTERN POWER GRADER



Power in the front drivers makes it safe to work along the top of a steep bank.



The teamwork of All-Wheel Drive and All-Wheel Steer makes the grader as sure footed as a mule.



Working upgrade on hairpin switchbacks is easy for the A-W grader.

Power Graders • Motor Sweepers • Road Rollers • Hydraulic Cranes

September 1957 — CONSTRUCTION METHODS and Equipment — Page 143

All-Wheel Drive, All-Wheel Steer work together... doing things impossible for ordinary graders

Graders with rear drive only have to push the lazy, dead weight of the front end, which requires extra power and thus lowers the operating efficiency. Put power on the front wheels and you get *working weight—not dead weight*. Then all weight is on driving wheels, contributing 100 percent to traction.

All-Wheel Steer makes Austin-Western graders twice as maneuverable as those with front steer only; steering that lets you "swing that rear-end" for handling every job with maximum efficiency.

All-Wheel Drive for maximum mobility and 30 percent more Power-at-the-Blade—power that is made still more effective by Torque Converter drive. All-Wheel Steer for extreme maneuverability. Put them together and you have teamwork that keeps Austin-Western Power Graders working where other graders fail. Austin-Western Works, Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Aurora, Illinois.



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FOR MEN WHO BUY EQUIPMENT FOR WHAT IT SAVES

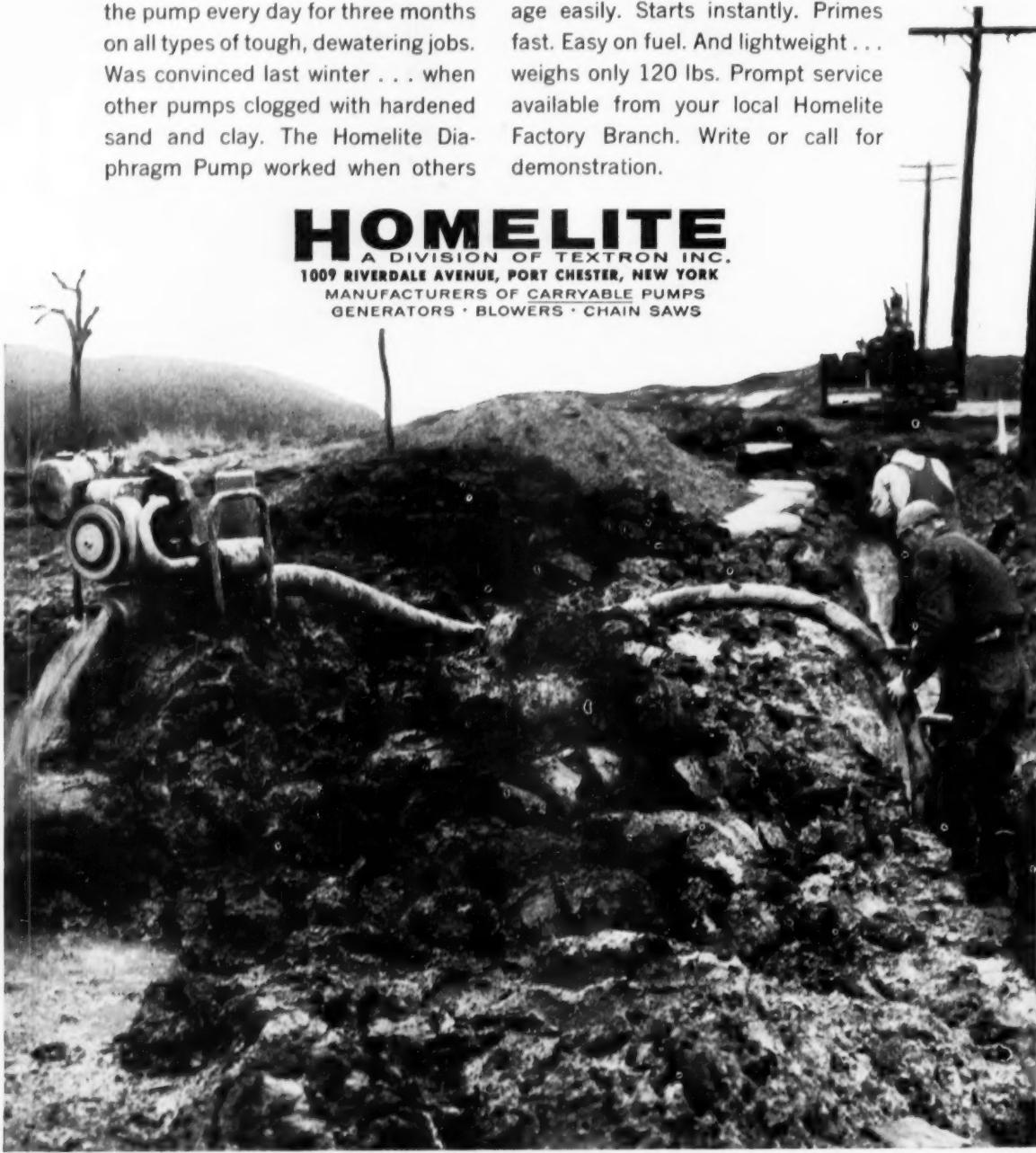
"Not one dime's worth of maintenance"

Mr. Joe Cloghessy, Pres.
T. F. Cloghessy, Inc.
Hammond, Ind.

That's this contractor's cost record with a Homelite Diaphragm Pump. Zero for maintenance . . . and he used the pump every day for three months on all types of tough, dewatering jobs. Was convinced last winter . . . when other pumps clogged with hardened sand and clay. The Homelite Diaphragm Pump worked when others

wouldn't. Handles water thick with mud, sand, clay, gravel freely. Pumps 5,000 gals. per hour. Handles seepage easily. Starts instantly. Primes fast. Easy on fuel. And lightweight . . . weighs only 120 lbs. Prompt service available from your local Homelite Factory Branch. Write or call for demonstration.

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MANUFACTURERS OF CARRYABLE PUMPS
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Complete Line of Homelite Carryable Construction Equipment Now Available



Self-Priming Centrifugal Pumps . . . Carry these lightweight, dependable pumps anywhere. Non-clogging design . . . 28 foot suction lift . . . capacities up to 15,000 g.p.h. . . sizes from 1½" to 3". Diaphragm pump also available.



Chain Saws For Every Job . . . Now you can choose from a full line of lightweight, powerful Homelite chain saws. From 3½ to 7 horsepower . . . 19 to 29 pounds. Brush cutting and clearing attachments are available to handle all your cutting jobs.



Carryable Gasoline Engine-Driven Generators . . . Lightweight Homelite generators can be carried and used anywhere to provide high-cycle and 115 volt power for your electric vibrators, tools, and floodlights. Complete range of sizes up to 5,000 watts . . . all standard voltages.

HOMELITE

a division of Textron Inc.
PORT CHESTER, NEW YORK

ROOF HANGARS . . .

continued

and was made up of three parallel timber trusses built to the shape of the corrugation. Bottom truss chords spanned 9 ft, and top chords spanned 21 ft. Trusses were 5 ft deep.

Connecting the three trusses on the sloping faces were 2x4-in. purlines laid flat and spaced on 10-in. centers. Over these the contractor tacked a ¼-in. hardware cloth to serve as the sloping face of the mule.

Concrete was worked down behind the form with small vibrators. The wire mesh kept the form from floating out and permitted air to escape while retaining the concrete.

The mule was left in place until concrete set. A crane then picked it up and moved it to its new position. Horizontal portions of the corrugations next were poured.

A roof section containing 10,000 sq ft of surface was placed in a single day. Test cylinders were taken frequently to insure accurate control. Concrete was designed for 4,000 psi. Falsework was not removed until a minimum of 2,400 psi was reached.

In Miami—A Different Story

An electric vibrating screed pulled horizontally along the sloping sides of the corrugations by cable and winch is Howland's answer to the pouring problem.

Howland had a look at the Kansas City top form, the "mule," and decided it was too complicated. Instead, he adapted a Master electric vibrating screed 13 ft long for the job.

Bottom horizontal forms first are poured and vibrated with two Mall 30-in., 2-hp electric vibrators. Sides next are poured. A crane dumps concrete (¾-in. limestone was added to give the mix body) in front of the screed. The screed then is pulled by cable and winch vertically along the corrugation walls to provide a finish. Use of a very stiff mix helped keep the concrete from puddling down.

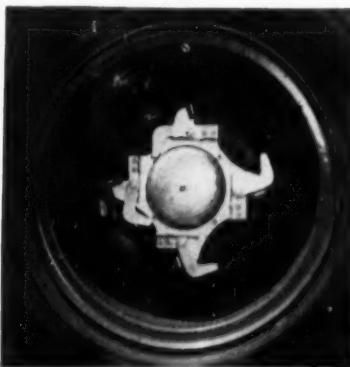
In New York—The Unusual

A smart ladder arrangement keeps 4,000-psi Lelite concrete from sloping down form sides on Grove's job at New York International Airport.

Corrugations on this job rise 6 ft and rake upwards at about a



**It warns men
he can't!**



BULLARD MECHANICAL

Back-Up Alarm

Almost every day on some crowded job site, with trucks maneuvering forwards and backwards, a driver grinds into reverse . . . rear vision is blocked . . . then . . . tragedy!

This simple, failproof, mechanical back-up alarm never forgets to warn men behind. A loud klaxon-like bell rings the minute wheels turn in reverse. It is a complete self-contained unit that can be easily installed on almost all vehicles with conventional wheels.

Write for technical literature, installation instructions and test reports



E. D. BULLARD COMPANY, Sausalito, California

ROOF HANGARS... continued

45-deg angle for the entire length of each corrugation. A wood ladder with rungs 12 ft long is placed against the form. Small pegs keep the rungs the proper slab thickness from the form.

This ladder retains concrete temporarily while it is being screeded, vibrated, and finished. After concrete takes its initial set, the ladder is removed and holes in the surface are pointed up. Grove pour corrugation sides first, then pours top and bottom flat slabs.

Grove concretes by crane and bucket. Concrete is deposited into a roof-top hopper and transported to pour areas by buggy. Stripping forms begins after seven days.

Again in New York— A Departure

A miniature canal paver is Corbett's answer to the problem. Here corrugations also are identical in rise and rake for their entire length.

Corbett lifts concrete by crane

and bucket to roof-top hoppers. From these, buggies carry the concrete to the unique paver that places and screeds the concrete.

Corbett commissioned Heltzel Steel Form and Iron Co. to make up the lightweight paver with a blade that would fit the dimensions of the corrugations. Heltzel came up with a beauty. The machine rides on rails set on wood chocks on top of the forms.

Concrete flows down a series of vertical baffles on the leading edge of the machine. These baffles support the concrete along the slopes while electric impact vibrators attached to the inside of the machine's blade vibrate the concrete. Movement of the blade strikes off the concrete at its proper thickness.

Lelite concrete with a strength of 3,500 psi containing 6½ gal of water for each bag of cement produces concrete for the slab with a 2 to 3-in. slump.

Once a section of slab is completed, a crane lifts the machine off the rails and carries it over to a new set of rails. Rails for the first pour then are removed along with their supporting chocks. Indentations left in the concrete are pointed up.

Utica Will Use Ladders Too

Thompson will pour the cantilevered corrugated roof slabs in 60-ft longitudinal sections using a ladder arrangement adapted from the Grove job to retain concrete.

Variations in corrugation heights ruled out use of a top form or other like device. Specifications on this job call for 4,000-psi lightweight concrete with form decentering permitted when concrete reaches 2,500 psi. Concrete will be placed by crane and bucket.

continued on next page

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POWER PERFORMANCE

in a light weight, man-size

WISCONSIN
Air-Cooled
ENGINE

the NEW
56 H.P.
Model VR4D
4-Cylinder Engine

• Climaxing years of engineering development, this great new engine offers manufacturers and users of power equipment all the advantages of AIR-COOLING, at temperatures from low sub-zero to 140° F., in an exceptionally rugged engine that measures up to any "heavy weight" industrial type liquid-cooled engine, horsepower for horsepower, with many plus values.

The outstanding High Torque characteristic of the Model VR4D engine, combined with its extremely rugged construction and heavy-duty stamina, provide load-lugging holding power, long life and top power performance.

Advanced "V" design provides an extremely compact power package which includes all traditional Wisconsin heavy-duty features such as tapered roller main bearings plus additional new features.

This new engine rounds out a complete line, comprising 15 models in 4-cycle single cylinder, 2- and 4-cylinder sizes, from 3 to 56 hp. Write for "Spec" Bulletin S-207.

Model VR4D Open Engine with heavy-duty clutch, rotating screen, electrical equipment and pre-cleaner.

WISCONSIN MOTOR CORPORATION

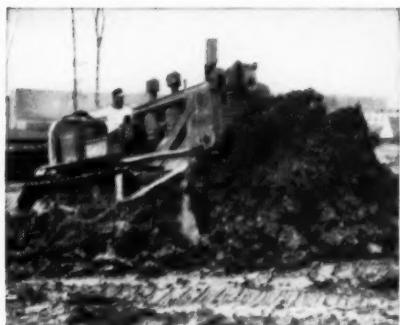
World's Largest Builders of Heavy-Duty Air-Cooled Engines

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Dozing—But Never Dozing Off.
Moving earth for new Interchange north of Washington, dozers average 3000-4000 hrs. before overhaul using Cities Service C-300 Motor Oil!

Greene in Name Only. Veteran construction man Ralph Greene is one of Washington's largest earth movers. He refuses to baby his trucks. With Cities Service lubricants they can take it!



At work on new interchange:
Greene & Dyer, Inc., Washington, D. C.



Trucks go 7000 hrs. without overhaul— Shovel chalks up 8500 hrs.

Big earth mover strikes paydirt with Cities Service Products

In the past year, Greene & Dyer, Inc. has moved 1½ million yards of earth in building an Interchange for the new road system north of Washington, D. C.

To do it, President Ralph Greene has kept his trucks, dozers and shovels running constantly under grueling mud and dust conditions. For, as he says: "We're in business to move dirt, not to baby trucks."

Nevertheless, Greene's equipment is rolling up one record after another, using Cities Service

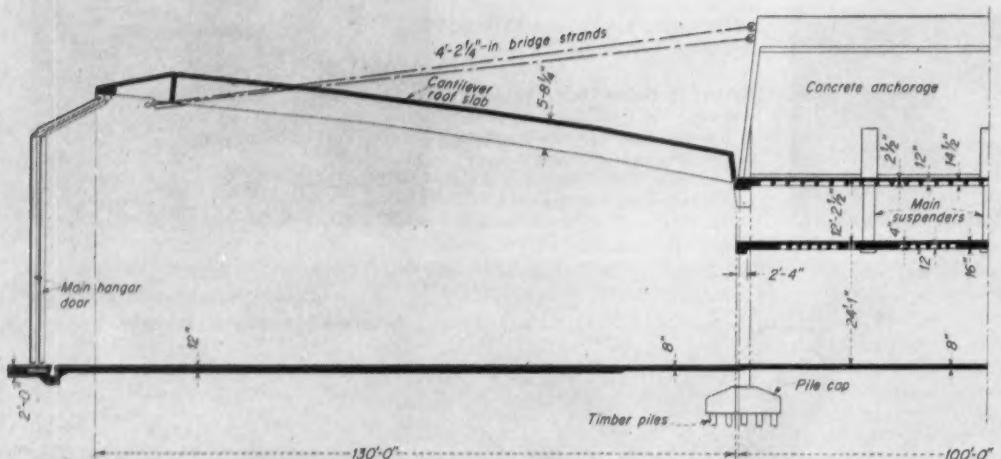
C-300 Motor Oil and Cities Service fuels and greases.

Dozers are getting 3000-4000 hours before overhaul. Trucks are rolling up 65,000 miles—or about 7000 hours each. And one shovel has gone 8500 hours with no overhaul yet needed.

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ROOF HANGARS... continued

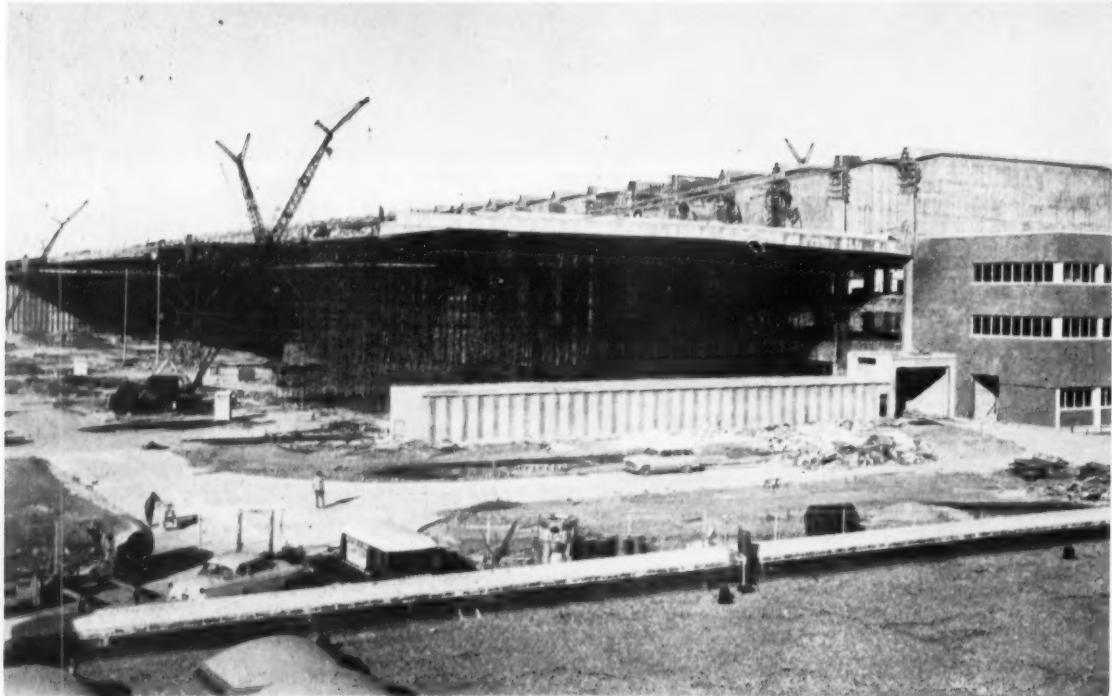


CABLE JACKING GOES FAST—Jack grasps cable and reacts against tip of roof concrete. Action of stressing cable (anchored to

wall, right) raises roof approximately 2 in. and decenters the form except at the anchor building terminal point.

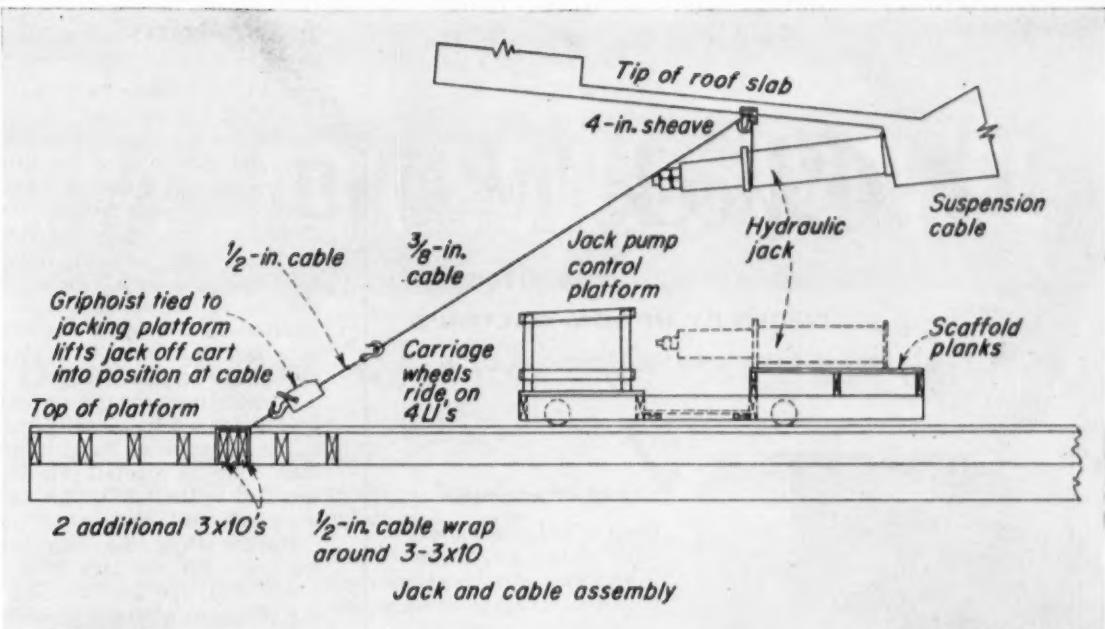
SOLVING PROBLEM THREE:

Bootstrap Jacking Suspends Roofs



PREPARING TO STRESS—Workmen atop tubular scaffolds get ready to stress suspender cables (coiled at anchor wall). A crane

will unwind the cables and thread them through inserts previously placed at the tip of the roof during the concrete pour.



JACKING CART EASES HANDLING—Small cart used to support heavy jacks that will stress suspension cables rides over a timber

platform built into the top of the traveler used on the Corbett job. Small griphoist lifts jack by cable into place.

and Decenters Forms

STRESSING OF SUSPENSION CABLES on each of the suspended-type roofs makes use of bootstrap jacking methods that simultaneously stress suspension cables and decenter slab forms.

Concrete anchor walls on the hangar at Kansas City were post-tensioned with four lengths of cable. Steel plates attached to these post-tensioned cables served as anchors for four lengths of 2½-in. bridge strand that suspend the roofs.

After roof concrete was poured and anchor walls were post-tensioned, these suspended cables were strung out by crane and inserted in anchorage sleeves at the roof tip.

Jacking of cables then began. Both roofs were worked simultaneously. The contractor attached hydraulic jacks to the outer ends of the cables and took up a load of 100 kips. Jacks reacted against roof-tip concrete. This was done on both roofs at the same time with crews keeping in touch with one another by radio. This initial stressing took up the slack.

Jacks then applied a total load of 280 kips into each of the cables through the anchor wall. The stress was held by nuts pulling up against wall ends. A final stress of 200 kips per cable was applied to the roof suspenders.

The jack reacting against the roof concrete while stressing the cable literally lifted the slab off

its form by its own bootstrap.

On Grove's job at New York International Airport, concrete for a roof section cures seven days before suspension operations begin. Actual jacking operations on this job are similar to those used at Kansas City with minor differences.

Grove built a timber platform inside each traveler top to provide moving space for men working jacks. Sixteen cables—eight on each roof section—are stressed simultaneously.

Tensioning all 16 cables raises the end of the slab 2 in. This not only sets the slab elevation but frees the forms at every point ex-



STRESSING COMPLETED—First section of corrugated concrete roof at Kansas City job hangs suspended by cables. Traveler (rear) has been moved to next pour site.

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ROOF HANGARS . . . continued

cept where the slab joins the anchor wall. During stressing, jacking shims are dropped between jack and slab to hold the stress.

Corbetta uses a similar jacking method to suspend the roof. But, to facilitate movement of jacks, Corbetta built a small timber platform inside each traveler near the top of the upper wedge. A small wood cart set on this serves as a jack cradle. This is placed on rails set on the platform.

A cable runs around the jack, up through a 5-in. sheave secured to the underside of the slab form, then down to a small grip hoist attached to the rear of the jacking platform.

By operating the grip hoist, workmen lift the jack from its cradle and into position against the roof slab where it is secured to the suspension cable. The cable then is stressed.

Tensioning the cables to proper stress raises the end of the slab 2 in. This sets the slab elevation and frees the form. The jack then is lowered onto its cart.

Who the People Are . . .

MacDonald - Creighton (Kansas City), Louis Boos, project manager; Fred Howland, Inc. (Miami), W. R. Little, project manager; Grove, Shephard, Wilson & Kruege, Inc., (New York) A. R. Maxwell, project manager; Corbetta Construction Co. (New York) Raymond Vitolo, project manager; Thompson Construction Co. (Utica) Michael Bartholemew, project manager.

Amman & Whitney, New York consultant engineers, took part as either consultants or actual designers on each of the five jobs. In Kansas City they were consultants to Burns & MacDonnel, engineers; in Miami, consultants to Weed, Russell & Johnson, architects; in New York, consultants to Chester L. Churchill, architect, on the Corbetta job; and consultants to the New York Port Authority Engineering Department, on the Grove job; in Utica, the firm undertook the entire design for Oneida County who will own the hangar.

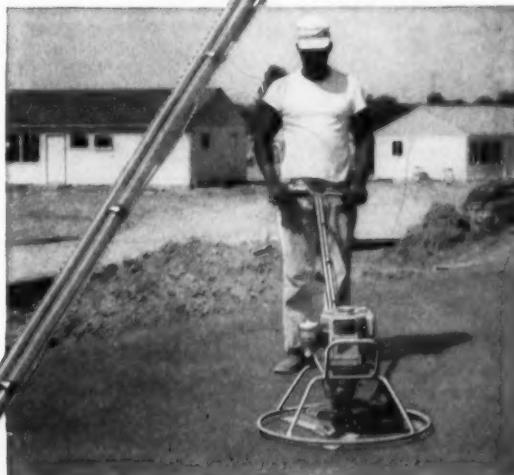
Much of the design and installation of jacks used in both the travelers and for stressing of suspension cables was done by Elgood Hydraulics Corp. of New York, and The Freyssinet Co., New York.

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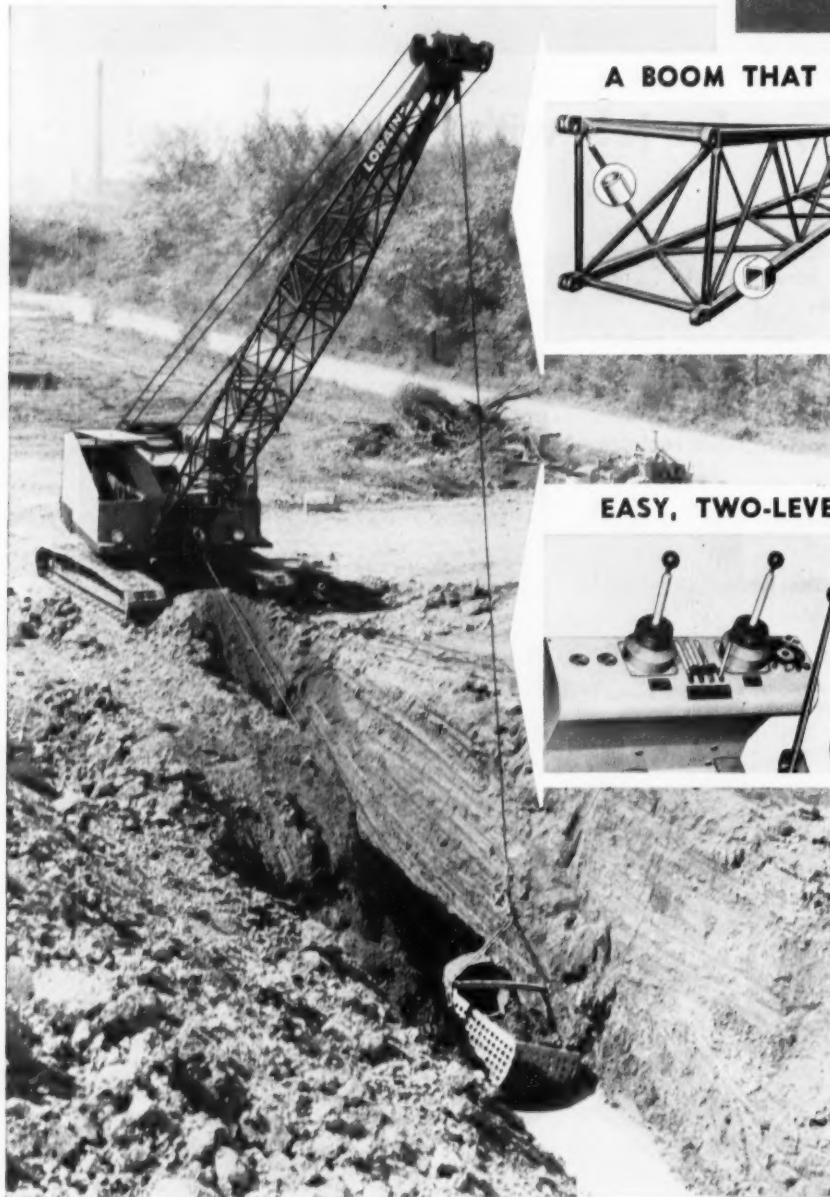
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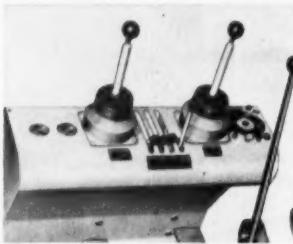


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T-SHAPED BAR penetrates fresh concrete at joint location. Vibrating at 5,000 vpm, it dislodges aggregate, leaving weakened mortar section that saws can cut easily.

New Rig Speeds Joint Sawing

SAWING JOINTS in concrete pavement, a relatively new technique, has taken an important forward step with the development of pre-vibrated, weakened plane joints.

The present method of sawing a joint with no advance preparation can be pretty expensive when the aggregate material is hard. In some cases costs are prohibitive.

In the new approach, the aggregate is vibrated away from the joint section right after pouring, leaving only mortar for the saws to cut. To do this, a special machine that follows the regular

paving equipment inserts a vibrating beam, called a cutter beam, into the fresh concrete at the location of the joint. The beam jostles the aggregate a fraction of an inch to either side of it, and if it is withdrawn correctly, mortar rather than aggregate will take its place, leaving a weakened section.

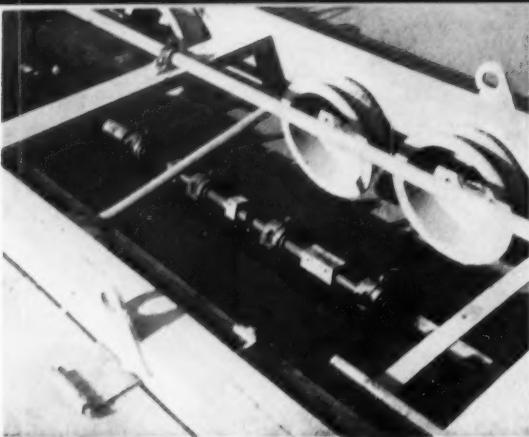
The machine, called a Vibro-Joint Cutter, was designed by A. J. Frederickson when he was a paving engineer for the Corps of Engineers. He is now with Seaman-Andwall Corp. of Milwaukee, Wis., the company that is developing and marketing the

machine.

The method has already been successful at the Air Force Base at Plattsburg, N. Y., and at Kelly Air Force Base, San Antonio, Tex. Peter Kiewit Sons' Co. of Omaha currently is using it on a \$3.5 million contract to add 70 acres of 19-in. pavement to Altus Air Force Base in Oklahoma.

The Machine

Two models are currently in production—Model 12, which handles paving widths from 10-15 ft, and Model 25 for lanes of 18-25 ft. Telescoping members, secured by set screws, allow ad-

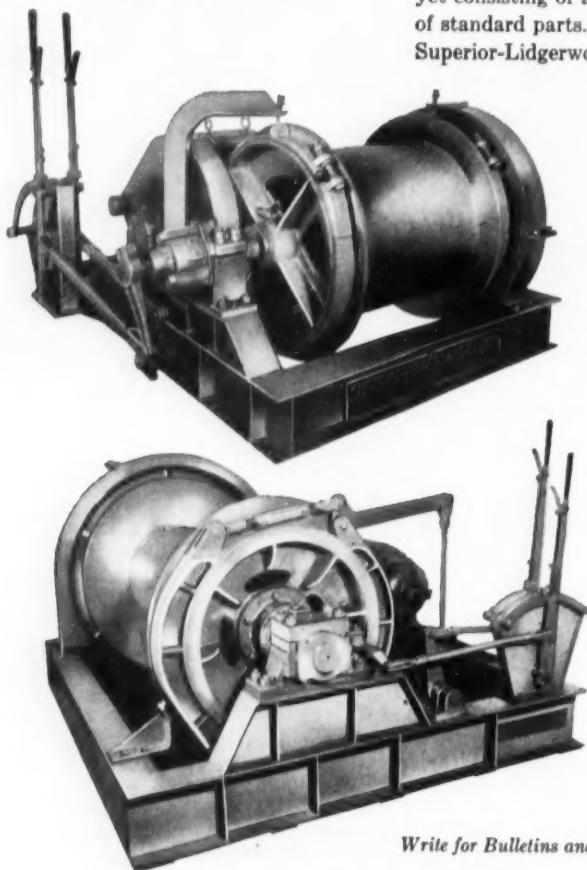


VIBRATING MECHANISM (left) is shaft with eccentric weights, fixed to T-bar flange.

CRACKS (right) appear only at joints. There is little uncontrolled cracking.

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JOINT SAWING RIG . . .

continued

justment to any width within these ranges.

The rig is self-propelled, powered by a 13½-hp Wisconsin TF engine. It rides standard concrete forms or adjacent concrete just like a finishing machine. Electric brakes secure the traveling mechanism during stops.

The T-shaped cutter bar is located in a transverse position under the carriage. Future models also will mount a longitudinal bar so that longitudinal as well as transverse joints can be handled.

Vibration of the cutter bar is developed through a flexible shaft connected to a stationary shaft mounted on the cutter bar. The stationary shaft mounts several eccentric weights that rotate at 5,000 cycles per min to provide the vibration.

The machine works in the paving spread so that vibration separation of the coarse aggregate at joint locations follows right after machine finishing of the concrete.

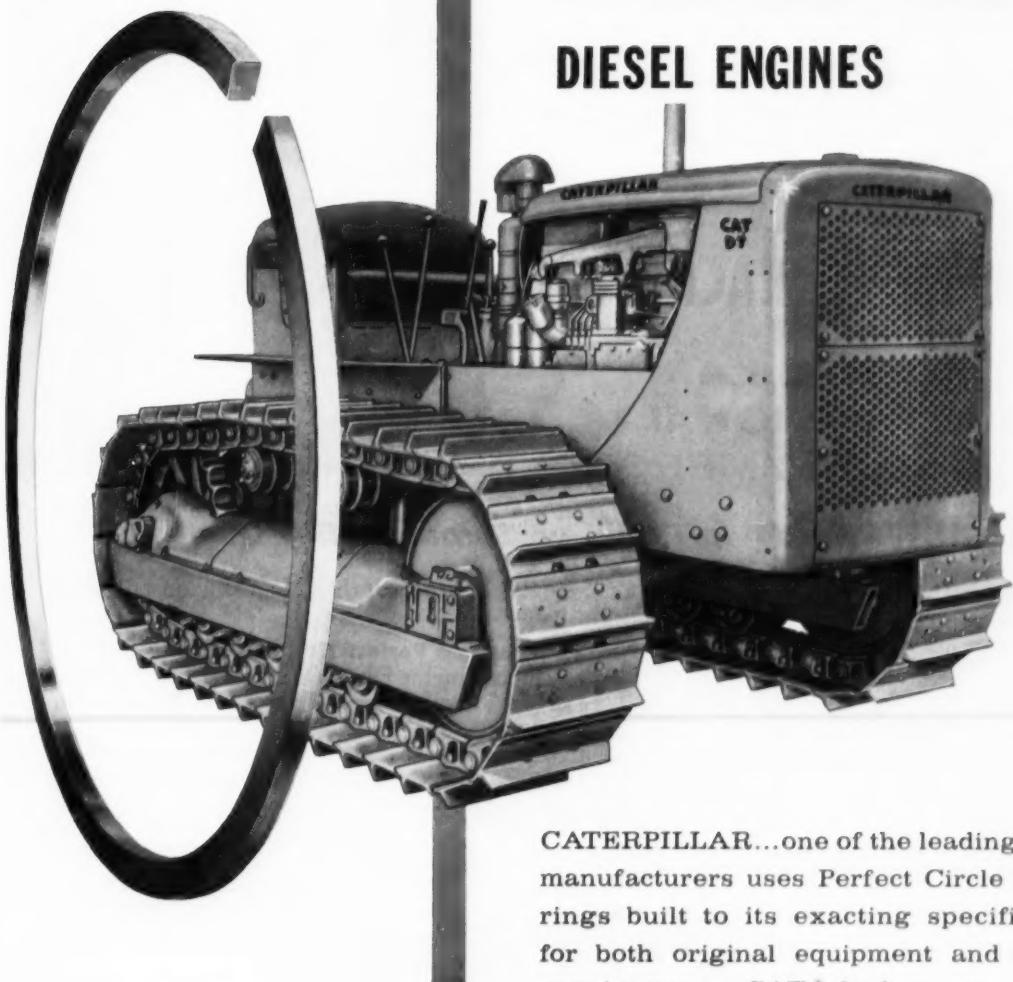
To achieve maximum separation, the T-bar is lowered slowly at full vibration into the concrete, then withdrawn rapidly. This prevents the aggregate from closing in at the joint location after it has been vibrated away.

The solid bar on current machines is effective for stiff concrete. For more fluid mixes, the manufacturer is testing a perforated T-bar, which may prove more effective for concrete having up to 3½-in. slump.

continued on page 157

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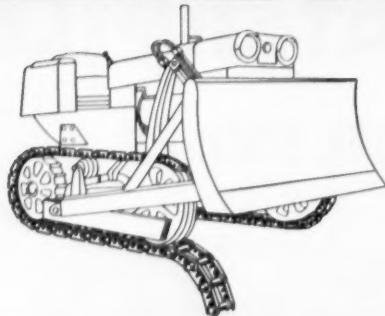


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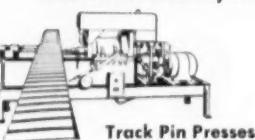
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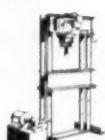
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Cost Savings

Vibration separation adds an additional step to the sawing operation. But the cost of this extra step is more than offset by savings in the sawing itself.

There are two reasons for the savings. Cheaper saw blades can be used. And even the cheaper blades last longer when they don't have to cut granite aggregates.

Seaman-Andwall has worked out a cost comparison for very hard concrete. Diamond blades cost \$210 each and last for about 525 ft of cutting. Including labor and saw rental, it costs 44¢ per ft to cut joints with these blades.

Vibro-Joint treated locations in this same concrete can be cut without water, using fiber carbide blades costing \$7 each. These blades last for only 150 ft, but with labor and saw rental plus rental of the Vibro machine, the final cost is only 10.5¢ per ft.

These estimates were prepared by the manufacturer and represent an extreme case. They are supported by few case histories since the method is very new. But it seems fairly clear that Vibro-Joint treatment can cut costs considerably where the concrete aggregate is hard.

To achieve these savings the saw must cut exactly the same section that was weakened by the vibrator because a cheap saw blade is uneconomical in hard aggregate. This calls for accurate marking of the form to locate the cut and great care in placing the machines.

In addition to the savings in equipment costs, there is a considerable time saving. At Altus, estimates put it at 50%. On the Plattsburg job accurate measurements were made on 20-ft lane. On vibrated joints the cut took 1.3 min. Making the same cut on unprepared concrete took 5 min and used three times as much power.

Sawing costs vary directly with depth so it is important to cut no deeper than necessary. Specifications across the country vary, but at Altus they cut to 1/6 the depth of the slab.

Results

Vibration treatment seems to have additional advantages over unprepared sawed joints in addi-

tion to cost savings. At Altus, sawers were able to start cutting the joints 3 hr sooner than they could have with unvibrated joints because there was no large-size aggregate to crack out while the concrete was still weak.

More important, there was less uncontrolled cracking. When pavement is poured continuously, and joints are not cut until it is hard, cracks may appear anywhere as the concrete hardens

and contracts. Vibration treatment weakens a plane in the slab, and if a crack occurs it will be along this plane, exactly where it is wanted.

At Altus, standard sawing was used on half the 550,000 sq yd of pavement. Corps of Engineers measurements showed a 5.8% incidence of uncontrolled cracking on this half. On the half where Vibro joints were used the incidence was only 0.4%.

DUMPCRETES help solve heavy traffic problem on DETROIT EXPRESSWAY job



The Cooke Contracting Company worked Dumpercretes during off-peak traffic hours to average 2500 feet of concrete pavement per day in widening Detroit Industrial Expressway. Highway Department check showed 500 vehicles passing the paving site *each hour*. 14 miles of 8' to 12' widths totalled 110,000 sq. yds.—hauled and placed by 6 Dumpercretes from central plant.

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THREE OPERATIONS are underway simultaneously at Wishon Dam, high in California Sierras. Two Northwest cranes at left place rock

for leveling course as third crane handles concrete. Behind crane, monitors sluice dumped rock in core of dam.

Efficient Rock Placing Speeds High Dams

WELL ORGANIZED TEAMS of men and equipment working high in the California Sierras are pushing to completion a pair of massive rockfill dams. In fact, their progress for this type work may be the fastest on record.

Part of Pacific Gas and Electric Co.'s Kings River development, Wishon Dam is on the north bank of the Kings River, and Courtright Dam is on Helms Creek, a tributary. The 3,700,-

000-yd Wishon Dam is at elevation 6,550 and the 1,500,000 yd Courtright Dam is at elevation 8,170. Both are tied to a 6½-mi tunnel and underground powerhouse. (See page 166).

Because of the dams' remote locations, engineers chose rock fill as the construction material. Earth for a rolled core was not available, and the problem of hauling in cement and other materials ruled out concrete. Besides,

the high mountains offer an abundance of excellent granite.

Each of the dams consists of a huge central mass of dumped and sluiced rock covered by a leveling course of crane-placed rock, with the upstream face sealed with a layer of concrete. Wishon Dam has a structural height of 290 ft, and Courtright has a comparable height of 310 ft. Crest length of Wishon is 3,200 ft; Courtright is 950 ft.

Rapid progress on the two dams is the result of sharp planning and tight organizing by the contractor, a joint venture sponsored by Morrison-Knudsen Co. and including Walsh Construction Co. and the Perini Corp. M-K carries on all major construction operations simultaneously. Some crews quarry rock while others haul it,

continued on page 160



R. V. "Ronnie" Klarer, A. Teichert & Sons, Inc., Engineering Contractors, Sacramento, California

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Big Quarries Supply Rock



HIGH DAMS... continued

dump and sluice it, or place concrete.

Most rock for Wishon is acquired at a primary quarry a half mile away. The rest comes from spillway excavation. Blast holes 6½-in. in dia are drilled with an Ingersoll-Rand Drillmaster. Laid out in a 15x18-ft pattern, holes are drilled 52 ft deep to pull a 45-ft quarry face. A shot of 70 holes shatters about 450 yd of rock.

At Courtright dam, Gardner-Denver Air-Tracs drill 2¾-in. holes in a 7x8-ft pattern. Drilling at the Wishon spillway quarry is handled by Joy drills with 4-in. bits. Holes are spaced 8-ft apart.

M-K has experimented successfully with ammonia nitrate as an explosive. Developed by chemical firms as a fertilizer, it is much



ROCK is loaded at Wishon Dam quarry by Bucyrus-Erie 150B electric shovel with 6½-yd bucket. Fleet of Euclid 17-yd trucks haul to site. Left, Air-Tracs drill blast holes on 8-ft centers in main Courtright Dam quarry.

cheaper than ordinary powder. But it has not been used extensively in construction because it is a heavy gas producer.

At Wishon, M-K had some difficulty with the chemical in wet weather, but in dry weather it produced a powder factor of 1 lb per yd. Working 9 hr, production has averaged 14,000 yd a day at Wishon and 8,000 yd at Courtright.

Sluicing

Most of the blasted rock is excavated with Bucyrus-Erie 6½-yd electric shovels. Fleets of Euclid trucks haul rock to the dam sites and dump it in lifts from 60 to 150 ft high. The tumbling action of the rock as it falls down the long slopes greatly improves compaction. And to accelerate settlement, hydraulic monitor jets sluice the dumped rock, washing out the fines. At Wishon, the volume of sluicing

water required is about three times the volume of dumped rock. At Courtright, only twice the volume is needed because the rock is exceptionally good, and also because water is not plentiful.

One of the costliest operations on the job is placing the leveling course of rock over the dumped-rock core. At Wishon, for instance, cost of placed rock is one third that of all the rock in the dam. Yet, placed rock amounts only to 200,000 yd of a total of 3,700,000 yd.

Leveling Course

The placed rock layer consists mostly of rocks from 3 to 15 tons. Smaller rock is placed in the voids between the large units, and remaining voids are chinked with even smaller rock. However, no pieces may be smaller than 2 in.

At Wishon, rock is placed by five Northwest cranes with 80-ft booms. Each crane has its own crew to drill lifting holes in the rocks and handle placing. Two pins inserted in the drill holes permit fast handling. The lifting hook and block assembly is controlled by the crane's two hoist lines as if it were a clamshell bucket. This rigging cuts time-consuming boozing and provides better control when placing the rock.

Good organization has pushed rock placing production to 135 yd per crane per day. This is said to



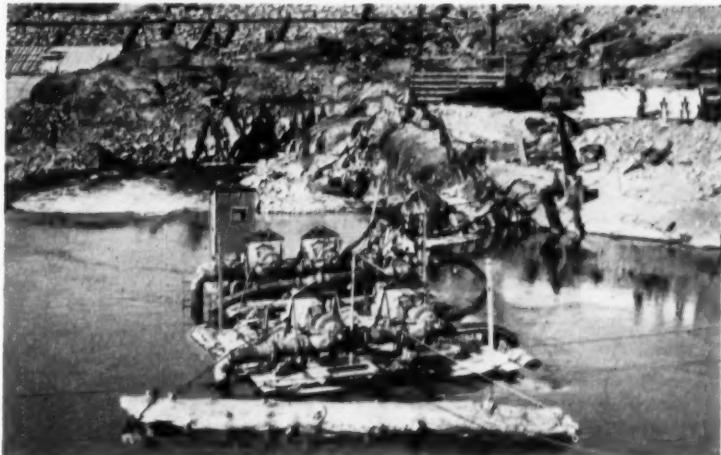
**Monitors Sluice
Dumped Rock**

HYDRAULIC CONTROLS developed by water pressure handle powerful Stang Intelli-Giant monitor. Right, battery of four raft-mounted Gardner-Denver pumps powered by 250-hp motors supply water to jets at rate of 6,000 gpm at 465-ft head.

be considerably better than has been achieved on past rockfill jobs.

Concrete Facing

The concrete facing on the steep 1:1 slope is cast in 60-ft square panels at a minimum thickness of 1 ft. To provide for settlement, both horizontal and vertical joints are built in. Concrete beams are



MONITORS sluice rock fill in high narrow canyon at Courtright Dam. Sluicing washes out fines, accelerates settlement. Volume of

sluicing water required is two or three times volume of dam. Rock is dumped down lifts as long as 150 ft.

Cranes Place Leveling Course



JACKHAMMER drills holes in rock to accommodate Lewis lifting pins.



ROCK is handled easily by two lines from crane, one through boom and other through fairleads. Rocks weigh up to 15 tons.



CONCRETE FACING is placed minimum of 1 ft thick by Gar-Bro bucket swung from 100-ft boom of Northwest crane. Lower third of dam is covered with planks to seat face.

HIGH DAMS...

continued

cast first at each joint location and mopped with asphalt to develop sliding action. The joint proper includes a copper water-stop covered with mastic.

Mixed in a Koehring 34E paver, concrete is fed directly into buckets which are swung over the face and dumped. After the concrete sets, a double layer of 2x12 tim-



GOOD METHODS assure rock placing rate of 135 yd a day per crane.

bers is laid over the lower third of the concrete to arrest future leakage by encouraging siltation.

Personnel

Walter Dreyer is vice president and chief engineer of Pacific Gas & Electric Co. For Morrison-Walsh-Perini, B. L. Perkins is project manager, H. D. Card is general superintendent at Wishon Dam, and Boyd Christiansen is general superintendent at Courtwright Dam.

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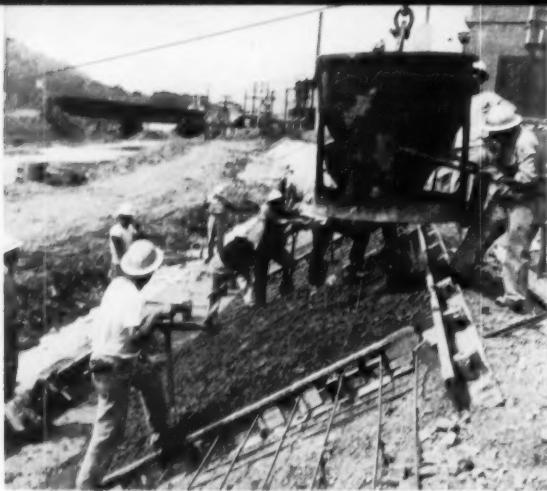
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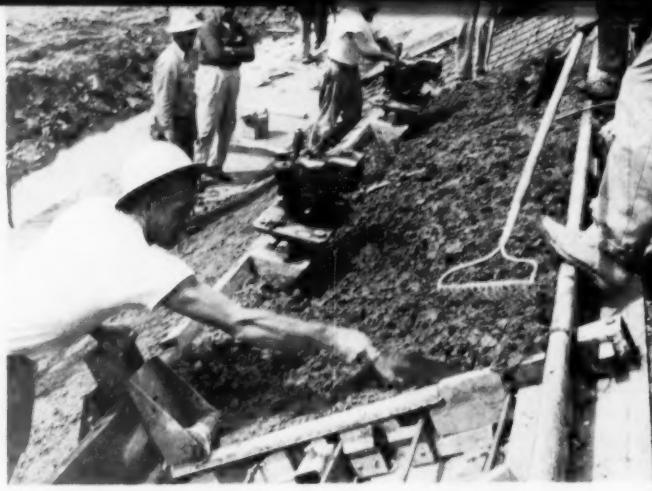


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Vibrating Screed Works on Slope

A VIBRATING SCREED, normally limited to horizontal slabs, is successfully screeding an 8-in. slab with a 1½:1 slope at Bradford, Pa.

The slab is part of the flood control wall which Elmhurst Contracting Co. of New York is building at Bradford for the Corp of Engineers under a \$2.2 million contract.

When specifications call for vibration of a sloping slab, as they do on this job, the usual procedure is to vibrate first, using internal vibrators, and then screed in a separate operation. A vibrating screed, which combines these operations, is not recommended for a steep slope because the concrete tends to bulge behind it.

J. F. Gibson, project manager for Elmhurst, believed that the economies of a vibrating screed could be applied even to a 1½:1 slope. Stow Manufacturing Co. of Binghamton, N. Y., was able to adapt a standard Model JS screed to do the job.

The screed is a 15-ft steel-edged beam that mounts two 2½-hp, 5,100-vpm Stow vibrating power units. Special mounting permits the gasoline engines to remain vertical at all times. The screed moves on side rollers that ride the steel side forms.

Screeding a sloping wall must be done from the bottom up. Because of the steepness of the slope and the stiffness of the concrete, it is impossible to move the screed by hand. So Elmhurst uses the power winch on a tow truck, with



SUCCESSFUL PASS by screed takes about a minute, leaves no bulging of concrete. Wall is poured in alternate sections, 15 ft wide, 18 ft high. Hand trowels finish job.

the cable attached to an eyebolt in the center of the screed.

The truck usually is located at the top of the slope. But when there is no room at the top the truck moves to the bottom and pulls the screed upward through a sheave. A crane moves the screed from one section to the next.

Usually only one pass, which takes about a minute, is required. Sometimes the concrete bulges behind the screed and another pass is needed. In spite of these occasional repeats, Gibson estimates that time and labor savings on the vibrating and screeding operation may be as high as 20%.

Eight 15x18 ft sections are poured each day. The 3-mi wall was started in April and should be finished this fall.

A surface vibrating screed can be used for steep sloping walls only under certain conditions.

- Slab thickness should be less than 12 in. Thicker structures usually cannot be vibrated adequately from the surface.
- Reinforcing must be widely spaced. At Bradford it was no problem to get the concrete between bars at 12-in. spacing.
- Concrete mix must be stiff. On this job, the Corps of Engineers specified a slump of 1½ in. This concrete, once in place, will hold the slope.



A-W Crushing Plant of J. J. Cronin Co., showing primary crusher at extreme left. Washer is in center of photo. Washed sand is delivered by the conveyor on left of washer, specification material by the three stock-piling conveyors at the right.

AUSTIN-WESTERN Crushing Plant giving high-speed production for J. J. Cronin Co., North Reading, Mass.

John Cronin reports: "We spent more than a month checking all makes before we purchased our Austin-Western plant in April, 1954. Since then, we have had every reason to be pleased with our decision. Production is fast, and we have very little downtime, as a result of the excellent engineering and rugged construction of the equipment. Present production includes: concrete sand and specification material in $\frac{1}{2}$, $\frac{3}{4}$ and $1\frac{1}{2}$ in. sizes."

In this operation, raw feed is delivered to a 36-in. feeder-grizzly combination and passes into the primary crusher, which has a jaw of 20 x 36 in. This is V-belt driven by a 75 hp slip-ring motor. The material is then conveyed to a 4 x 12 ft. single-deck screen. Larger sizes pass into a cone crusher,

which is V-belt driven by a 60 hp slip-ring motor. The washer is a 4 x 16 ft., 3-deck screen type, equipped with spray pipes. A single convenient push button station controls the entire closed-circuit system.

It will pay you to compare Austin-Western design and construction features before you invest in a crushing and screening plant. Each Austin-Western plant is designed to solve a particular production problem. Our engineers would welcome the opportunity to discuss your needs with you and to recommend the proper equipment.

See your nearby Austin-Western distributor today, or write to Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

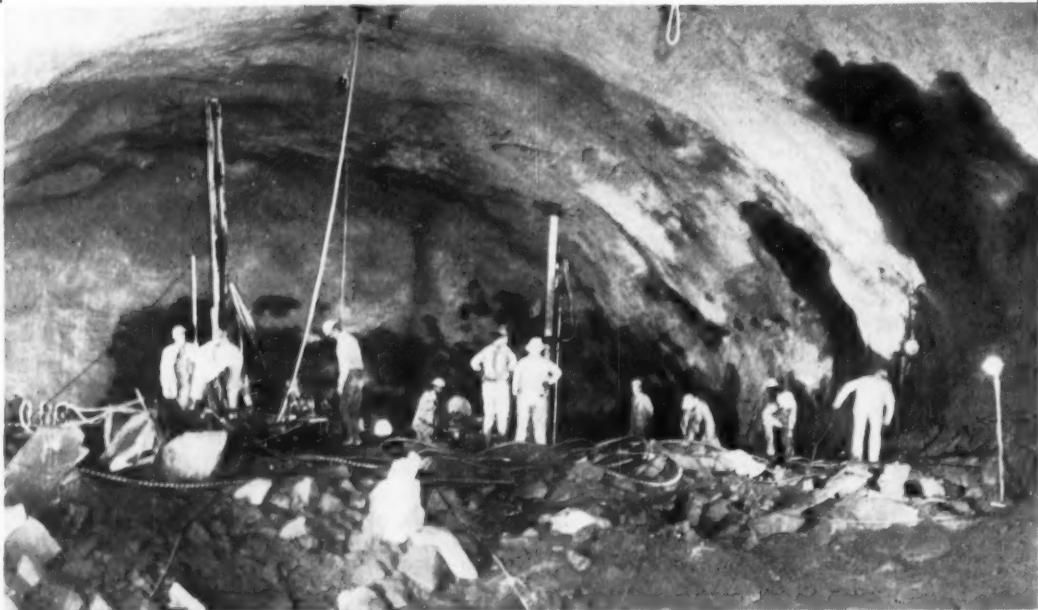
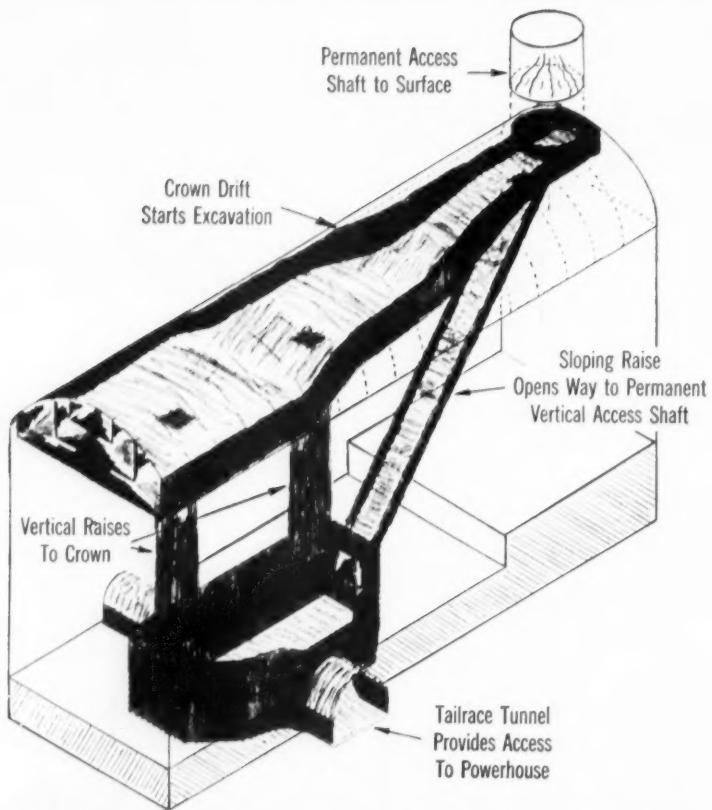
AUSTIN-WESTERN
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Crews Hollow Mountain



DOME nears completion and men begin to excavate downward in chamber. Air-Tracs equipped with wet heads to eliminate dust drill 2½-in. blast holes.

to Build Underground Powerhouse

GROWING RAPIDLY inside the heart of the rocky California Sierras is the country's largest underground powerhouse, plus a 6½-mi tunnel that will carry water to its turbines.

It's a rock man's paradise. They're sinking shafts, driving tunnels and penstocks, and, with painstaking precision, hollowing out the inside of a mountain.

A project of Pacific Gas & Electric Co., Haas Tunnel and Powerhouse is part of the Kings River Development, which also includes construction of two rockfill dams upstream. (See page 158).

The big job began late in 1956 when a contract was awarded to a joint-venture sponsored by Morrison-Knudsen Co. Known as Kings River Constructors, the combine also includes Henry J. Kaiser Co., Macco Corp., and Perini Corp. The powerhouse is expected to be completed this month, and the tunnel will be through next summer.

Powerhouse

Powerhouse excavation is unique. Men tunneled nearly 2,000 ft to get access to the core of a mountain where now they are hollowing out a cathedral-like chamber.

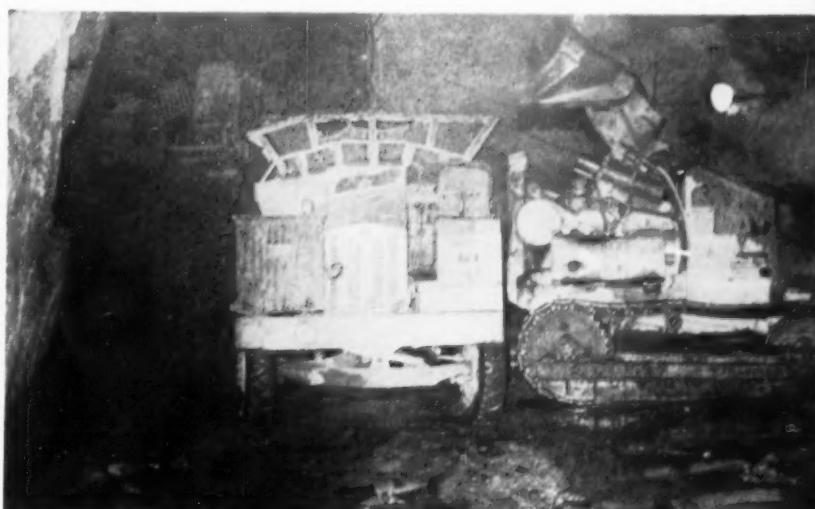
The powerhouse proper is 173 ft long by 85 ft high by 56 ft wide and includes 29,000 cu yd of material. However, in addition to the powerhouse the excavation contract includes a 400-ft long 18-ft-dia vertical access shaft and 750 ft of steeply inclined penstock tunnel.

The 17½-ft tailrace and access tunnel was excavated first with the help of a truck-mounted jumbo and burn-cut blasting. When the core of the mountain was reached, three raises were excavated from the bottom of the powerhouse. Two of these raises were 8x8-ft vertical shafts excavated to reach the dome of the powerhouse. And the third was a 5x10-ft shaft inclined on a 51-deg slope to gain access to a point from which a 400-ft pilot raise could be excavated to the surface to permit sinking of an access shaft.

continued on next page

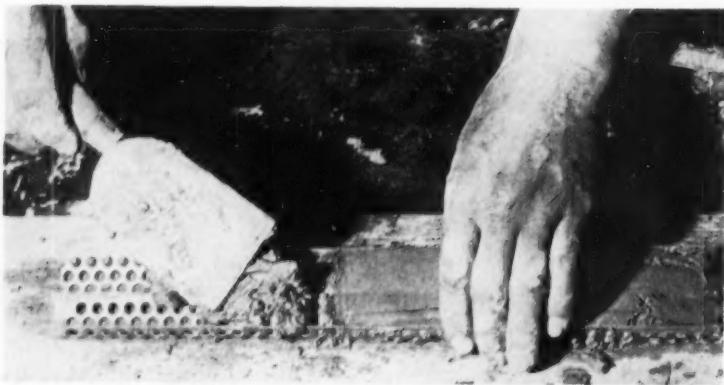


TIGHT QUARTERS in powerhouse crown area are no handicap for maneuverable Atlas Copco jackleg drills. Muck is removed by a small cable-operated scraper bucket.



MUCK in main powerhouse area is loaded into Dumper by Eimco 105 loader. Both units are equipped with exhaust scrubbers. Dumpers travel in tailrace tunnel.

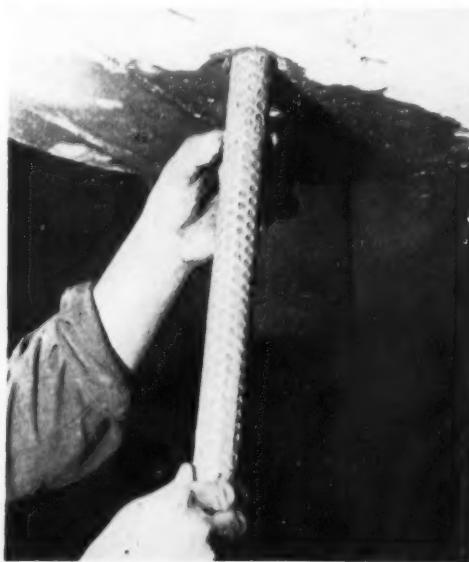
Grouted Re-Bar Makes Strong Roof Bolt



HALF SLEEVES made of 20-gage mild steel are filled by hand with thick mortar. Perforated units about 1 in. in dia come in lengths of 4, 6, and 8 ft.



WIRE ties two half sleeves together to form full sleeve. System is designed so that when re-bar is pushed through, mortar is forced through perforations.



FULL SLEEVE packed with mortar is inserted in hole just before rod is driven through

The two short raises extended to the crown of the powerhouse at which point an 8x8-ft crown drift was excavated the full length of the powerhouse. Working from the crown drift, the arch of the powerhouse next was excavated to 8 ft below the spring line. Almost all of this initial powerhouse work was accomplished with Atlas Copco jackleg drills. These drills have maneuverability that permitted drill holes to be spotted as needed.

Roof Bolting

Although the rock is an excellent granite, engineers specified roof bolting to prevent particles from falling on workers and later on operating equipment. As the crown was excavated, men drilled holes 15 ft deep into the roof on 3½-ft centers. Instead of the conventional split-end wedgetype bolt, the contractor followed a Swedish-developed system by which 1-in. reinforcing bars are anchored in mortar. The method centers around split perforated sleeves. Half sleeves filled with thick mortar are wired together and inserted into a hole as a full sleeve. When a rod is driven through, mortar is forced out the perforations filling the drill hole and anchoring the rod.

Later, 4x4-in. wire mesh is laid over the roof, held in place by short crossed rods welded to the anchored rods. When the 1,200 bolts were in place, the entire roof was blanketed with 4 in. of Gunite.

After the Gunited roof had been installed, excavation started on the powerhouse mass. Holes were drilled down by two Gardner-Denver Air-Tracs. To permit these large drills to operate underground, wet heads were installed to eliminate dust. The Air-Tracs drilled 2½-in. holes on 6-ft centers. Three lifts brought the remaining 50 ft of powerhouse excavation down to proper level.

In the crown of the powerhouse, mucking was accomplished by a "slusher," a scraper operated through a system of cables by an air tucker. Where the slusher couldn't reach, an Eimco 630 mucker substituted.

continued on page 172



graders strip 18" of clay fill along perimeter of $\frac{3}{4}$ mile-long borrow. With 2 Elegraders, Johnson, Drake, and Piper, Inc., excavated and loaded-out 600,000 yards for New York Thruway extension in suburban Buffalo.

2 graders dig & load 600,000 yds. with Elegraders

Johnson, Drake, and Piper, Inc. faced the problem of moving 600,000 yds. of dirt $3\frac{1}{2}$ miles over suburban Buffalo streets, for a section of New York Thruway. Contractor decided to haul by truck . . . to dig and load with two 150 hp Adams 660 graders, equipped with outrigger Elegraders.

27 trucks haul to bridge approach

Photos show J.D.&P. loading dirt for a bridge approach. 27 sideboarded 10-yd. dump trucks hauled 12-yd. loads thru Buffalo, to the fill. Two dozers, a sheep's foot, and a 50-ton pneumatic roller, spread and compacted dirt. A grader maintained haul roads and borrow area. Trucks hauled approximately $3\frac{1}{2}$ miles (one way) over city streets

— including 1200' on sand at borrow exit and 500' over average haul road at entrance.

Loads from $\frac{3}{4}$ mile-long borrow

Two "660's" with Elegraders loaded trucks in a flat area, cutting against the perimeter of the $\frac{3}{4}$ mile-long borrow. The two loaders worked in tandem. On this stripping operation, there was very little truck waiting-time — in fact, Elegrader could have kept more trucks busy on the lengthy $3\frac{1}{2}$ mile haul.

Strips clay @ 460 yds. per hour

Elegraders and trucks worked two 8-hour shifts daily. A man rode the front end of each grader to aid

truck-spotting, to count loads with timer, and to assure that haulers got a full heaped load. Each Elegrader dug and loaded at the rate of 460 loose yards of medium density clay per hour. Timing showed Elegrader heaped truck in as little as 40 seconds . . . plus 10 seconds for spotting of haulers.

Cut 18" deep at 2.3 to 3.3 mph

As the LeTourneau-Westinghouse grader moved forward in 1st or 2nd gear, Elegrader's 32" disc plow "peeled off" strips of almost-dry clay averaging 18" deep. Cut-depth sometimes reached 30" because of uneven ground. The endless ribbon of dirt was fed onto grader-driven, trough-type belt moving 450' per minute. Conveyor elevated dirt into trucks with little dust or spillage.

Get information and prices

Call or write for full details on Elegrader for use with 104, 123, 150, 190 hp Adams* graders. Other grader models: 60, 80 hp. No obligation.

*Trademark AE-1254-H.b-6



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ORTON



THE MOST POWERFUL NAME IN CRANES

Fifty years of experience applied directly to your handling problem, because every ORTON crane is custom-built, incorporating the most modern tested features as well as your requirements. Custom-built quality and utility at production-line prices and delivery — that's ORTON.

Every construction handling problem is unique. We want to start with your requirements. Write ORTON CRANE & SHOVEL CO., 608 S. Dearborn St., Chicago 5, Illinois.

NOTE: ORTON is also the oldest manufacturer of buckets. ORTON buckets are so superior that many users specify them on every crane they buy regardless of make.

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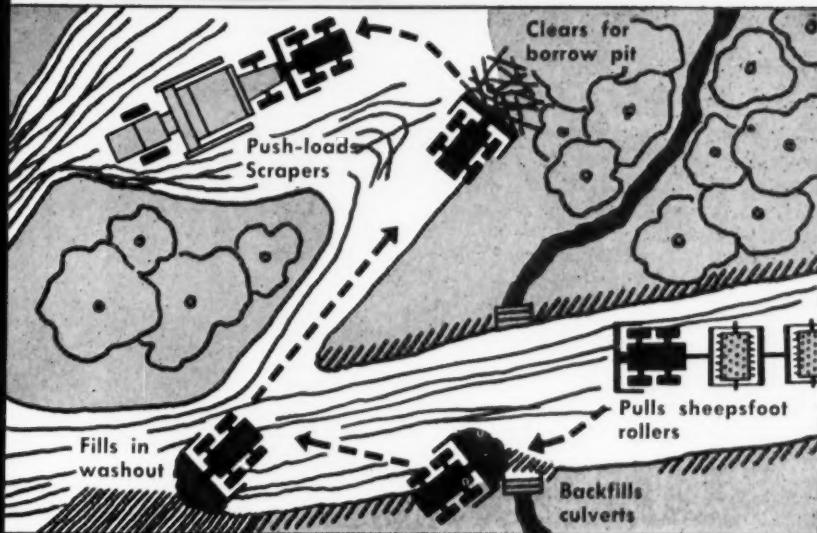
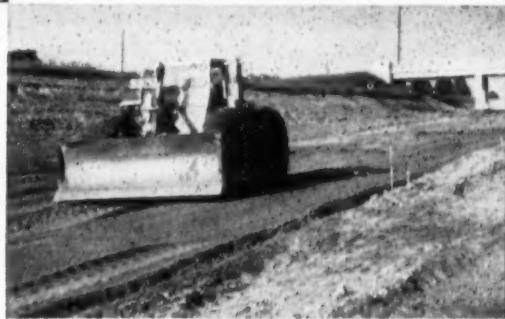


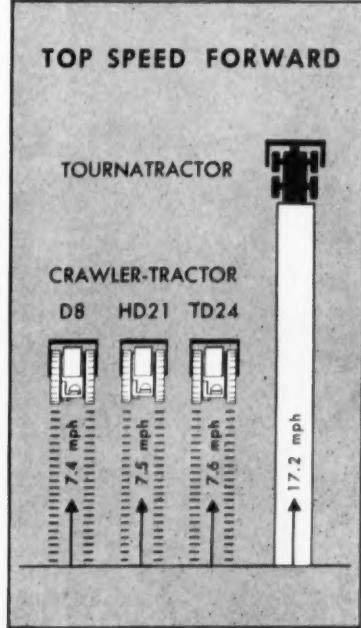
Diagram shows some of the many ways you can use Tournatractor's speed and mobility on your spread. Fast-moving tractor hustles back and forth between scattered assignments with minimum time lost travelling. In less than 4 minutes this 17 mph rig can be at work on a new task a mile away. It can easily handle 9 scattered one-hour assignments, averaging a mile apart, in a single 10-hour day.

Carl Goodwin & Sons, Allegan, Mich., needed a fast, mobile tractor to handle scattered dozing, towing, and pushing on a million-yd. Detroit to Chicago expressway job. This \$2,000,000 project called for 8 miles of 200' wide right-of-way with bridges and culverts. Goodwin bought a Tournatractor to fill his needs, because this machine gets into an area fast, does a job, and moves on to the next assignment without delay.

Photo shows rubber-tired Tournatractor back-blading as it compacts fill. Versatile, fast-moving rig also graded, backfilled culverts, and push-loaded scrapers. Other equipment on job included 9 C Tournapull scrapers, a crawler pusher, and a crawler-scraper team.



Why **EVERY** spread needs at least one high-speed **TROUBLE-SHOOTER**



To keep up with today's stepped-up dirt-moving schedules, you need faster, more mobile equipment. A careful analysis of your jobs—especially large-volume contracts—will show the need for rubber-tired tractors to handle the hundred-and-one scattered dozing, pushing, and pulling assignments on your spread. If you now use 100% crawlers, you should try at least one rubber-tired dozer NOW for the high speed assignments. Then analyze the extra profits it brings!

Cut your costs on "hit-and-run" jobs

Fast-moving, LeTourneau-Westinghouse 210 hp C Tournatractor®—with its travel speeds to 17.2 mph—gives you the perfect tool for "hit-and-run" tractor jobs. For example, whenever bottlenecks develop, anywhere on your spread, you can capitalize on Tournatractor's speed by dispatching this roving trouble-shooter wherever needed—to accelerate clearing, speed-up push-loading on short hauls, level fills, backfill culverts, fill in wash-outs, pull sheepfoot rollers, rooters, etc.

Think, also, of the time you save over the slow, cumbersome crawler method or job-to-job moves! With Tournatractor there's no moving in of truck and trailer, no loading and unloading, no extra manpower or expense. Operator just gets on and GOES.

Rubber best for scattered assignments, longer work cycles

Analyze your jobs. Then choose the equipment that will do the best job for you—with least time and expense. Where your work calls for maximum lugging power in limited-area operations, you need crawlers. But where you have scattered operations, long cycles, and frequent moves, Tournatractor's rubber-tired speed and mobility really pay off!

With larger yardage, bigger area jobs ahead, it will pay you to investigate the improved rubber-tired Tournatractor—product of 10 years of field experience all around the globe. Ask for a demonstration... see how this versatile rig can fit profitably into your busy dirtmoving schedule!

CT-1270-H-b



LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company,

Where quality is a habit

**UNDERGROUND
POWERHOUSE ...**
continued from page 168



RE-BAR driven into sleeve is anchored in mortar. Wire fabric is draped over roof.

WELDER tacks crossed bars to anchored roof bolts, fastening 4x4-in. welded wire fabric to powerhouse roof. Nearly 1,200 bolts are required to anchor roof.

Muck was hauled out of the tailrace tunnel by 6-cu-yd diesel-powered Dumptors, equipped with Marston scrubbers. An Eimco 105 did the loading.

Because of the operation of diesels in the tunnel, extra ventilation air was provided. Roots-Connersville blowers pushed 35,000 cfm of air through a pair of 26-in. ventilation pipes.

Compressed air for the powerhouse was provided through a 6-in. pipe by two 1,100-cfm Ingersoll-Rand units. Also leading to the heading was a 4-in. water pipe with high pressure water (300 psi) provided by a Bean pump.

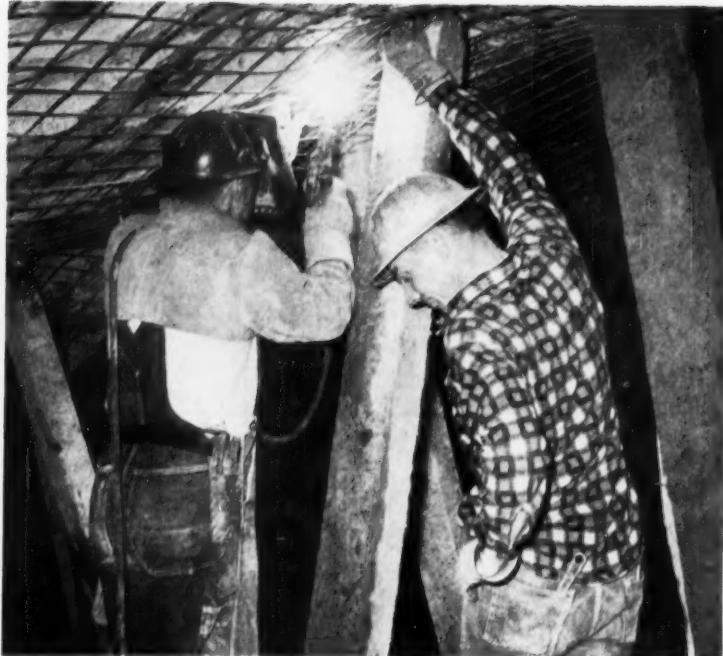
Penstock Tunnel

The inclined penstock tunnel was excavated to full size by raising from the bottom. Working platforms were attached to bull hooks set in the tunnel walls.

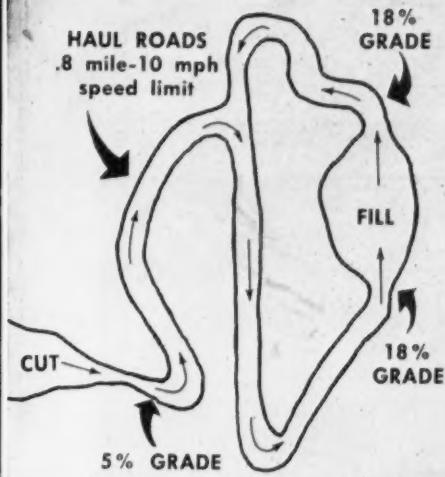
To drill the 8x6-ft pilot shaft for the 400-ft-high access shaft, workmen operated from a cage suspended by a cable leading through a 6-in.-dia diamond drill hole to a derrick on the surface.

After the powerhouse roof concreting was completed, the access shaft was expanded to full 18-ft-dia size by working from the top down, drilling with jackhammers. All muck from the access shaft as well as from the penstock tunnel was hauled out through the tailrace tunnel by the Dumptors.

continued on page 174

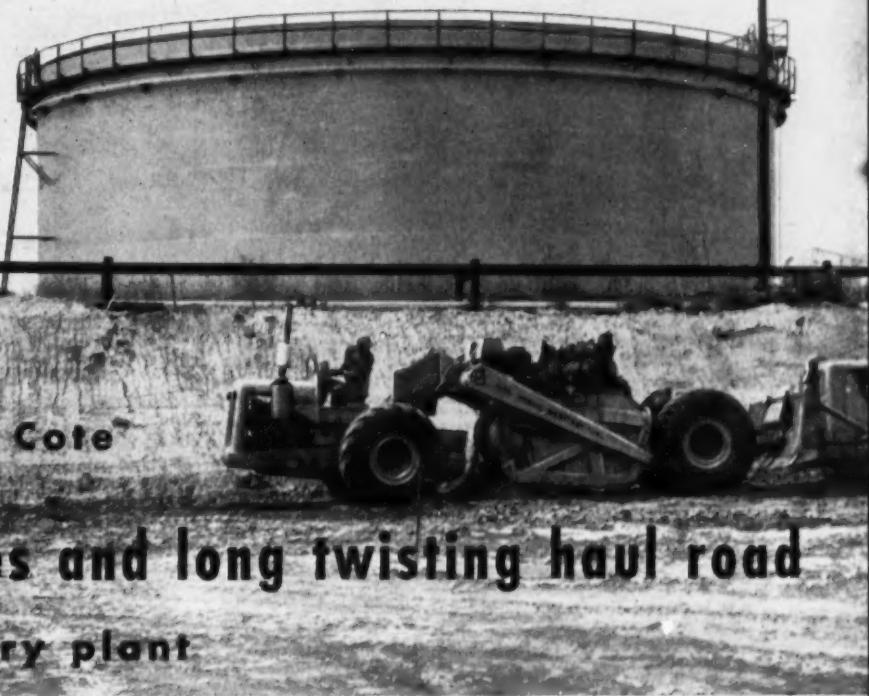


UNDERGROUND ROOF covered with fabric is ready to receive 4-in. coat of Gunite. Roof bolting prevents particles from falling on workers and later on machinery.



Haul and return route taken by Tournapulls. Narrow—with sharp, hairpin curves and 18% grades—this road would have been very difficult for any but 90° turn electric-steer D Tournapulls.

Grading for new oil refinery in Mo., one of Midwest Pre Cote's 6 D Tournapulls gets heaped 7½-yd. load of sandy clay in approx. 200'... hauls and returns over twisting, hilly 1.7-mile cycle.



How Midwest Pre Cote

beat 18% grades and long twisting haul road at new oil refinery plant

To keep up with demands for improved motor fuels, created by millions of modern automobiles, a large oil company is putting into operation a new alkalinization plant at Sugar Creek, Missouri. Midwest Pre Cote Company of Kansas City, Mo.—with their six LeTourneau-Westinghouse D Tournapulls—were given the job of moving 85,000 yds. of sand and clay, grading the plant area, building railroad rights-of-way and grading storm sewers.

Narrow haul road—18% grades
Equipped with built-up tailgates and sideboards, Midwest Pre Cote's fast D 'Pulls loaded approximately 7.5 cu. yds. in 200 feet, push-loaded by a 102 hp crawler tractor. The loaded machines then traveled up a 5% grade out of the borrow area. The .8 mile haul road was so narrow and twisting that it permitted only one-way traffic. Heaped loads were spread in thin even layers along a 600' area.

The haul road circled and climbed over grades as steep as 18%. With electric geared kingpin steer, maneuverable "D's" negotiated sharp curves and hairpin turns without difficulty or loss of time. Tournapull's easy maneuverability really paid off for Midwest Pre Cote in steady, profitable production on this job.

6 'Pulls 96.84% efficient

Detailed reports kept by the owner show that entire fleet of six Tournapull scrapers have operated with 96.84% efficiency on this job. The two newest machines have averaged 98.89% for their 822 working hours.

"D 'Pull can't be beat"

Foreman Carl Barnett says, "The dependability of the D 'Pulls can't be beat. On a job like this, with six machines working, there isn't any lost time on the pusher waiting to load." The Superintendent, C. P. Daniells, said, "We are very well satisfied with

the machines, and are one of the big users of LeTourneau-Westinghouse equipment in the Kansas City area."

New "D" narrower, with added capacity

An improved D Tournapull is now available. Only 8 feet wide, the new "D" meets 9-ton axle-limit and may be roaded anywhere without special permit. This earthmover has a capacity of 7.3 cubic yards struck and 9 cubic yards heaped.

D 'Pulls will fit your earthmoving needs

Profits in the expanding earthmoving industry will go to contractors who have their equipment fleets always "ready to go"—with the best equipment available. It will be to your advantage to find out how D Tournapulls can increase your dirtmoving capacity and profit possibilities. Ask for full details.

Tournapull—Trademark Reg. U.S. Pat. Off. DP-1202-B-b

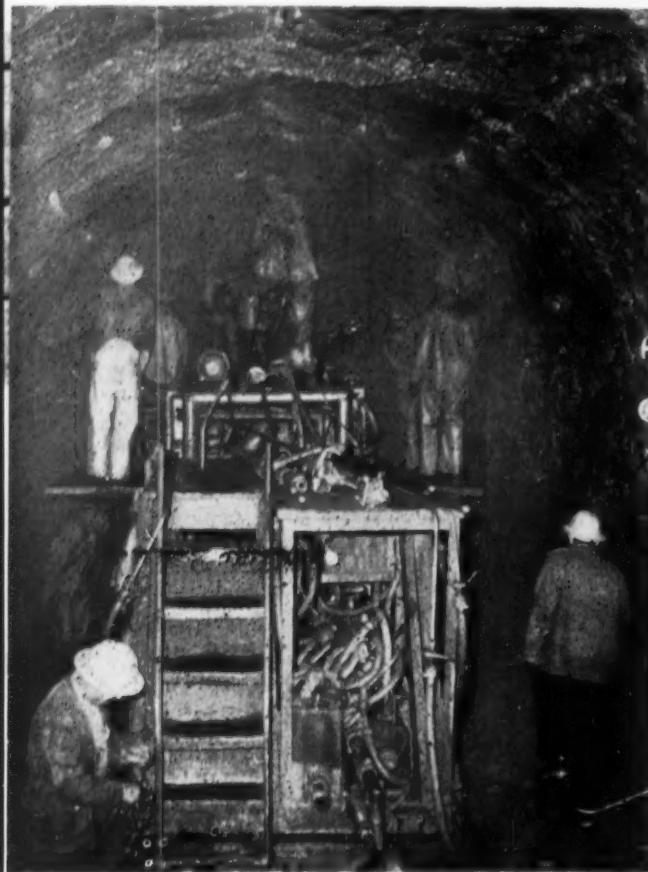


LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

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Two-Deck Jumbo Drills Long Tunnel



RAIL-MOUNTED JUMBO operating at tunnel face mounts six Gardner-Denver drifters on Ingersoll-Rand hydraulic jibs.

The $6\frac{1}{2}$ -mi horseshoe tunnel is being driven from two headings, reached by a 990-ft access adit about one-third the distance from the downstream end. Progress in the 13-ft dia bore has been as high as 131 ft a day for two headings on a three-shift basis. The average is about 120 ft a day.

Drilling is accomplished with a rail-mounted two-deck jumbo that mounts six Gardner-Denver drifters on Ingersoll-Rand hydraulic jibs. Using Bethlehem drill steel with tungsten carbide bits, $1\frac{1}{8}$ -in.-dia holes are drilled to 8- and 9-ft depths. Each round requires about 65 holes.

At the center of the face, a seven-hole burn cut is spotted for initial blast. Only two of these initial holes are loaded; the remaining holes help loosen the central part of the blast. The seven holes are arranged 12 in. apart in a cross pattern. Sur-

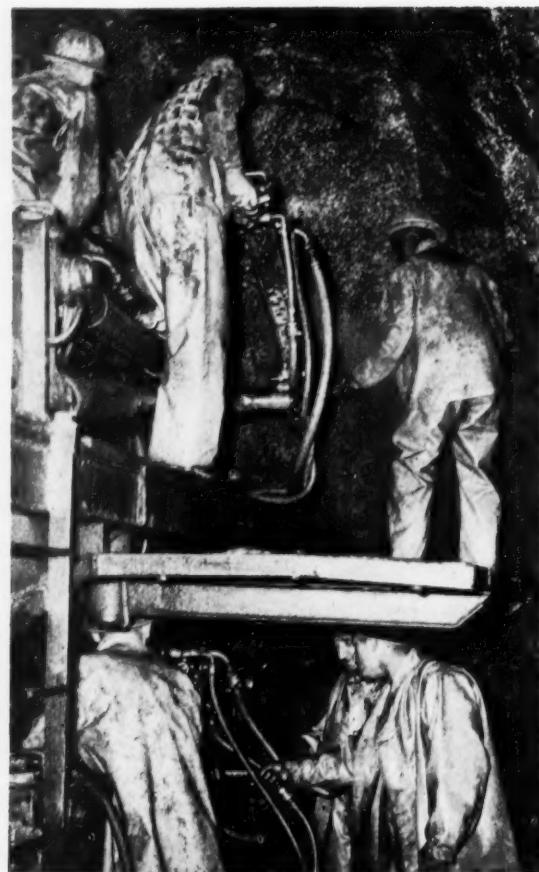
rounding the burn cut are additional holes on rings at about $2\frac{1}{2}$ -ft centers. Blasting involves 10 delays and pulls $7\frac{1}{2}$ to 8 ft of rock.

Each of the holes is loaded with 45% Atlas powder, with 60% powder for primer. About 300 lb of powder is needed each round to pull about 90 cu yd.

Material is excavated by 100-hp, electrically powered Conway muckers. It is hauled in 6-yd side dump cars arranged in seven and eight car trains and switched by a California switch kept close to the heading. The switch is moved about twice each week during drilling operations. Goodman 10-ton electric locomotives pull the trains.

Side Hill Dump

Rock is wasted down a side hill dump, but dump tracks are left stationary. A bulldozer on the



DRILLERS working from two decks drive 65 holes per round. Seven-hole burn cut at center of face helps break 90-yd round.

dump shoves material over the edge, eliminating the need for moving the tracks.

Drilling air is carried to the heading through 6-in. steel pipe with Victaulic couplings. The air installation consists of one 800-cfm and two 1,100-cfm Ingersoll-Rand air-cooled compressors, and one 1,100-cfm and two 500-cfm Gardner-Denver compressors.

Ventilating air is carried through 20 and 22-in. pipe with Joy Axivane blowers mounted in the pipe. These units provide 11,000 cfm at the heading. One pair of blowers is located near the portal of the adit, and successive pairs are spotted every 3,000 to 4,000 ft.

A special car has been developed to install the air pipe. It carries two 30-ft lengths of 20 or 22-in. line and is equipped with a hand-operated hydraulic jack that raises the pipe into position.



MUCK is excavated by 100-hp electrically powered Conway mucker and hauled in 6-yd side dump cars arranged in seven and eight

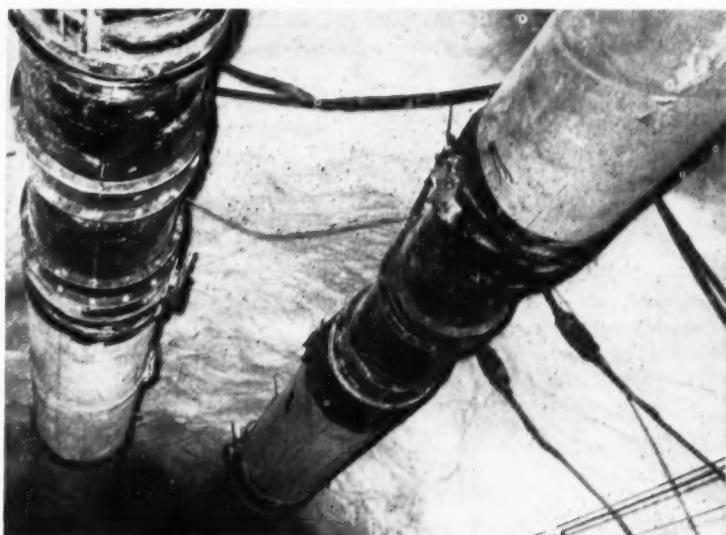
car trains. California switch kept close to heading is moved twice a week. Goodman locomotives pull trains.

High voltage electric power is brought into the tunnel and kept within 1,000 ft of the heading. This promotes more efficient operation of the electric muckers and blowers. Transformers step the 4,160-v power down to 440 v for muckers and blowers and to 110 v for lights. One extra General Electric transformer is in the tunnel to permit switching the position of the transformers to keep them near the heading.

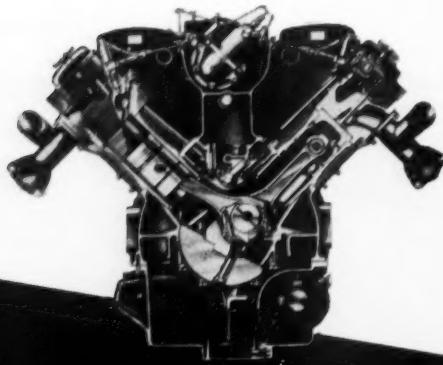
Personnel

The Kings River work is a project of the Pacific Gas & Electric Co. for whom Walter Dreyer is vice president and chief engineer.

For Kings River Constructors, Carl Larsen is powerhouse project manager, P. O. Lee is tunnel project manager, and John Erdle is project engineer.



PAIR of Joy Axivane blowers are mounted directly in 22-in. ventilating pipe every 3,000 or 4,000 ft. Combined with pair at portal, they supply 11,000 cfm.



Got a job for a **DIESEL?**

DEUTZ

Here's what DEUTZ DIESELS are doing for users in every application shown here, and many more!

More work done for every gallon of fuel...faster, easier starting...less time out for repairs...more power to hoist, move, lift, pump or swing...those are the benefits offered by DEUTZ DIESELS.

DEUTZ "AIRCOOLED" DIESELS range from 5 to 310 BHP in 1, 2, 3, 4, 6, 8, and 12 cylinder models. Quick starting, they run at top efficiency in any weather, at temperatures of -40° to +140° F. Higher operating temperatures assure more efficient fuel use, and greatly reduce corrosion due to condensation of sulphurous acids.

DEUTZ WATERCOOLED DIESELS range from 3 to 2000 BHP in 2, 4, 6, 8, and 12 cylinder models, naturally aspirated and turbo-charged. They are unequalled for ruggedness; simple, compact design; efficiency of operation under the toughest conditions.

There is a DEUTZ to do *your* job. Service and parts are available everywhere. Send coupon today for detailed descriptive catalog with scale drawings of the engines, performance data and action photographs.

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DEUTZ AIRCOOLED DIESELS DEUTZ WATERCOOLED DIESELS

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PARTIAL SPECIFICATIONS TABLE

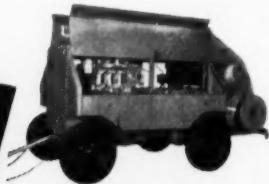
Model	Cont. BHP/Cont. RPM
F 1 L612	10/2000
F 2 L612	20/2000
F 3 L612	30/2000
F 4 L612	40/2000
F 6 L612	60/2000
A/F 2 L514	30/1600
A/F 3 L514	45/1600
A 4 L514	60/1800
A 6 L514/614	90/1800
A 8 L614	120/1800
A 12 L614	180/1800

Also a full range of automotive engines with 4, 6, 8 and 12 cylinders operating at 2300 RPM.

Watercooled Marine and Industrial Diesels, 2 and 4 cycle, from 3-2000 BHP in slow and medium speeds.



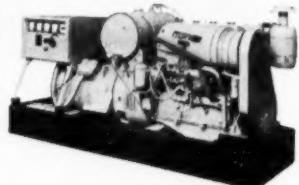
CONSTRUCTION



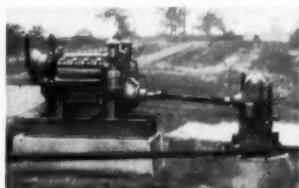
UTILITIES



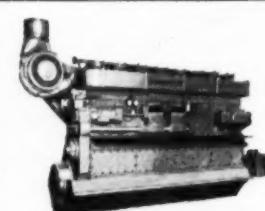
MINING



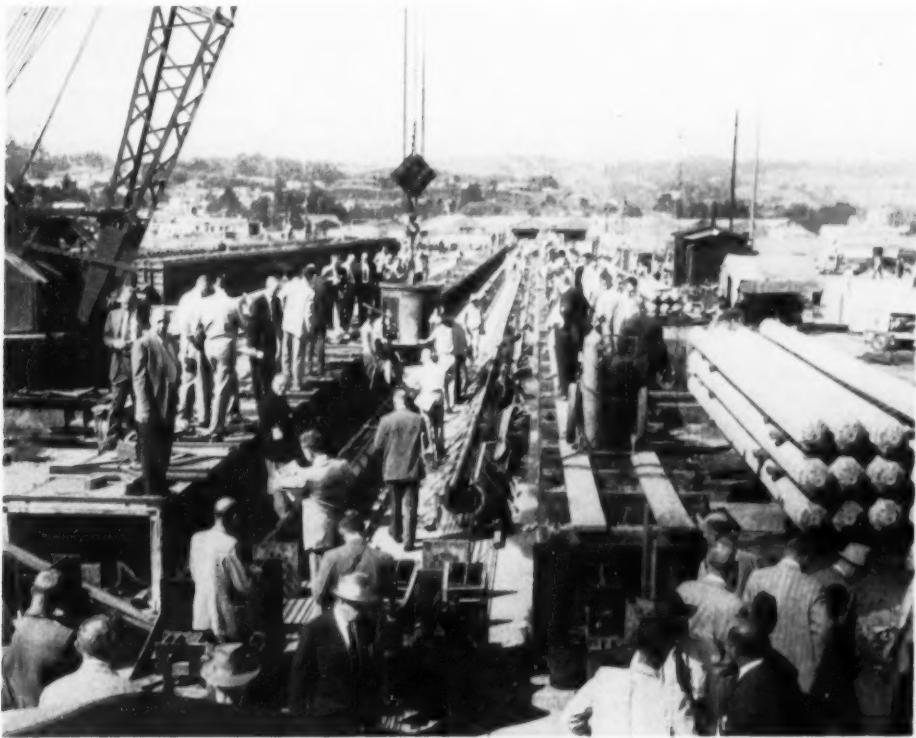
DIESEL ELECTRIC



IRRIGATION



MARINE



Construction men from all over the world gather for...

A Look at a Growing Industry

PRESTRESSED CONCRETE will plan an increasingly important role in construction of all types in the years to come. Construction men from all over the world, gathered at the World Conference on Prestressed Concrete in San Francisco, agreed to that forecast.

The conference drew a bumper attendance of 1,200 construction men from 30 foreign countries and more than 40 states. It was sponsored by the University of California with the cooperation of the Prestressed Concrete Institute, the International Federation for Prestressing, and other technical organizations.

The program included panel discussions, motion pictures, technical papers, and a day-long field trip with visits to the casting yards of Ben C. Gerwick Co. at Petaluma, Calif., and Basalt Rock Co. at Napa, Calif.

Keynote speaker William E. Dean, Florida's assistant state highway engineer, predicted a big future in the U.S. for prestressed concrete but warned that its use

demands competent engineering and good workmanship in construction.

Peter J. Verna, Jr., of Concrete Materials, Inc., Charlotte, N.C., pointed out that the number of prestressing plants in the U.S. has increased from only about a dozen in 1953 to more than 200 in operation or planned today. He said the reason for this rapid growth is that the prestressed concrete industry has proved it can do a better structural job economically.

Verna said U.S. prestressing plants strive for efficiency in wire storage, curing methods, concrete distribution methods, and materials handling. All are located near major highways; most have railroad facilities; and many have waterways close by.

Arthur L. Elliott of the California Bridge Department urged the development of better grouting equipment. He said high pressure grout pumps—up to 2,000 psi—have proved themselves recently in California. These pumps, he

said, can move grout of very stiff consistency into post-tensioning ducts. Water does not separate out to leave pockets in the grout.

Ben C. Gerwick, Jr., and W. J. Talbot of Ben C. Gerwick Co. and M. F. Fornerod of Raymond Concrete Pile Co. presented papers on prestressed piles. Other U.S. papers discussed various research efforts and described recent projects such as the Lake Pontchartrain Bridge in New Orleans, La., and the Illinois toll road prestressed bridge program.

Prestressing in Russia

A five-man Russian delegation took an active part in the conference. They pointed out that total production of prestressed concrete in the U.S.S.R. is close to the U.S. total. A Russian bridge engineer said there now are 150 prestressed railroad bridges and 200 highway bridges in use or under construction in Russia.

One member of the Russian group, Prof. V. V. Mikhailov, described a method of two and three

PRESTRESSED CONCRETE CONFERENCE... continued

axis reinforcement of concrete using continuous stressed wires. The method involves pretensioning by pulling wire from reels through a stressing station over preset pins. Automatic machines reel the wire onto the forms to facilitate large scale production of similar units.

Mikhailov said continuous plants of this type in Russia produce beams, slabs, wall panels, and smaller units such as purlins. They require highly skilled operators, and it's not possible to switch from one product to another without time-consuming resetting of the machines. But the high production of the plants, he said, more than offsets these disadvantages. Mikhailov told the conference there are more than 15 large plants in Russia specializing in continuous prestressed fabrication of residential buildings.

Most of the other presentations by experts from abroad dealt mainly with various design problems.

A highlight of the conference was the day-long field trip. A caravan of 21 buses hauled the

crowd first to the Gerwick plant to observe the casting of prestressed concrete piles. Three separate pretensioning beds—the longest of them 490 ft long—were in operation turning out 16-in.-dia octagonal piles, 20-in. square piles, and 26-in. square composite concrete and H-pile members.

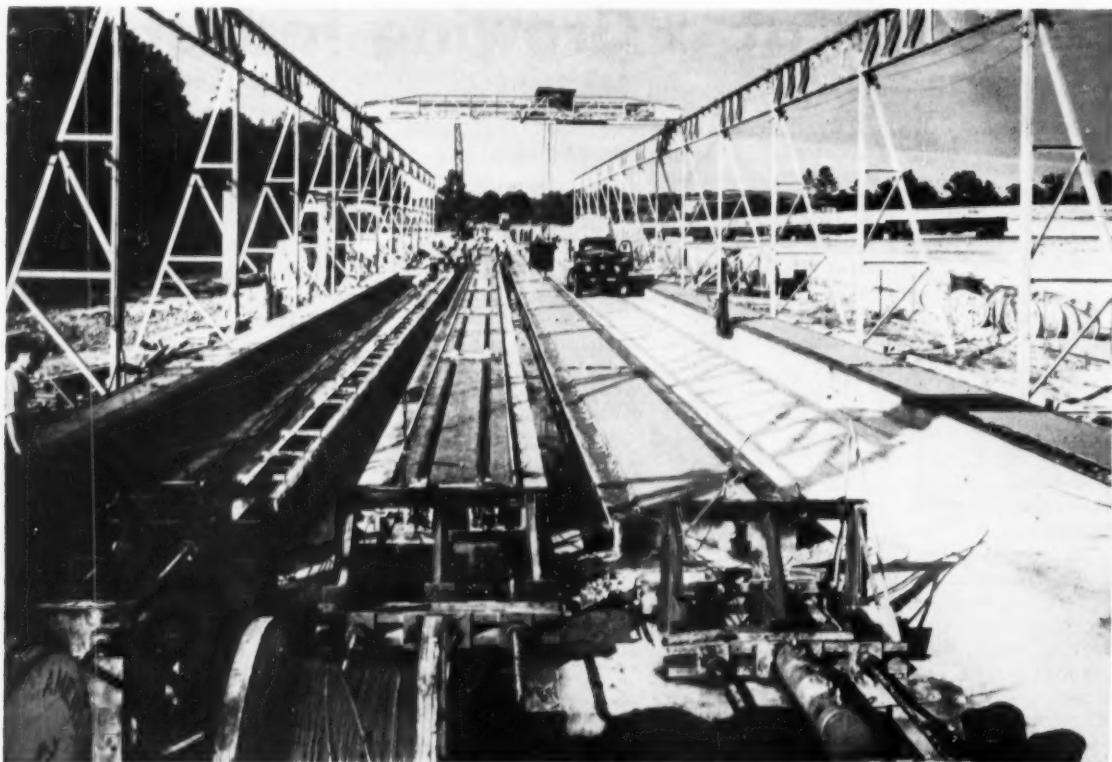
New Method

At the Gerwick yard the crowd also saw casting of 4½-ft deep T-beams for a bridge. These beams were pretensioned by a deflected strand method the Gerwick firm has developed. Eighteen of the 36 strands are deflected for better control.

At the Basalt Rock plant lunch was served to the visitors on 45-ft long double-T pretensioned roof slabs set on cushions of lightweight blocks. Then the group toured the plant. Basalt is set up to cast seven post-tensioned bridge girders a day plus 900 lin ft a week of pretensioned members. Most of the casting facilities are housed in a 65x1,000-ft building that is serviced by two 30-ton bridge cranes.



VISITORS on field trip watch Ben C. Gerwick Co. drive long composite piles.



TYPICAL of U.S. emphasis on efficiency is plant of Concrete Materials, Inc., in Charlotte, N.C., which was described at conference.

Plant has aisle to facilitate pouring from mixer trucks and removal of big double-T slabs on railroad cars.



One of the B-80 dumpers operated by Morse Sand & Gravel Company, Inc., of Attleboro, Mass.

two gravel-hauling dumpers supply **20 ready-mix trucks**

"Our two Mack dumpers operate nine hours a day supplying gravel for our fleet of 20 ready-mix trucks. Averaging six round trips an hour over our own roads, these Macks have hauled over 350,000 tons in the last six months. Continuous operation of these two dumpers is vital to us. That's why we chose Macks... and they've more than lived up to their reputation. So far, we've had only routine mainte-

nance and service to contend with." This is the experience of Mr. Alfred H. Morse, president of Morse Sand & Gravel.

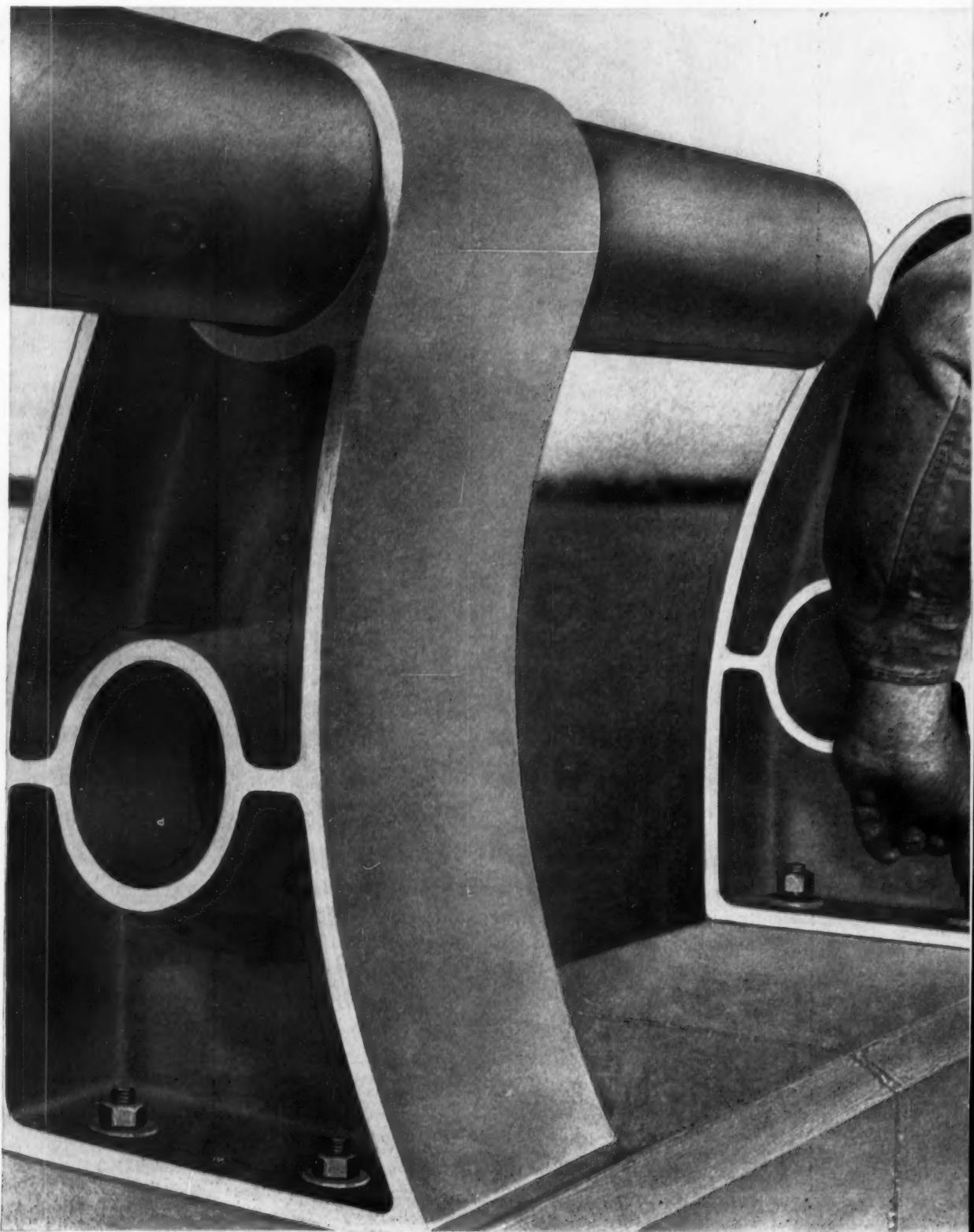
Macks are universally acknowledged for their outstanding performance, operating economy and stamina. On-the-job operating reports, like Mr. Morse's, show why.

Want more proof? Let your Mack representative show you the

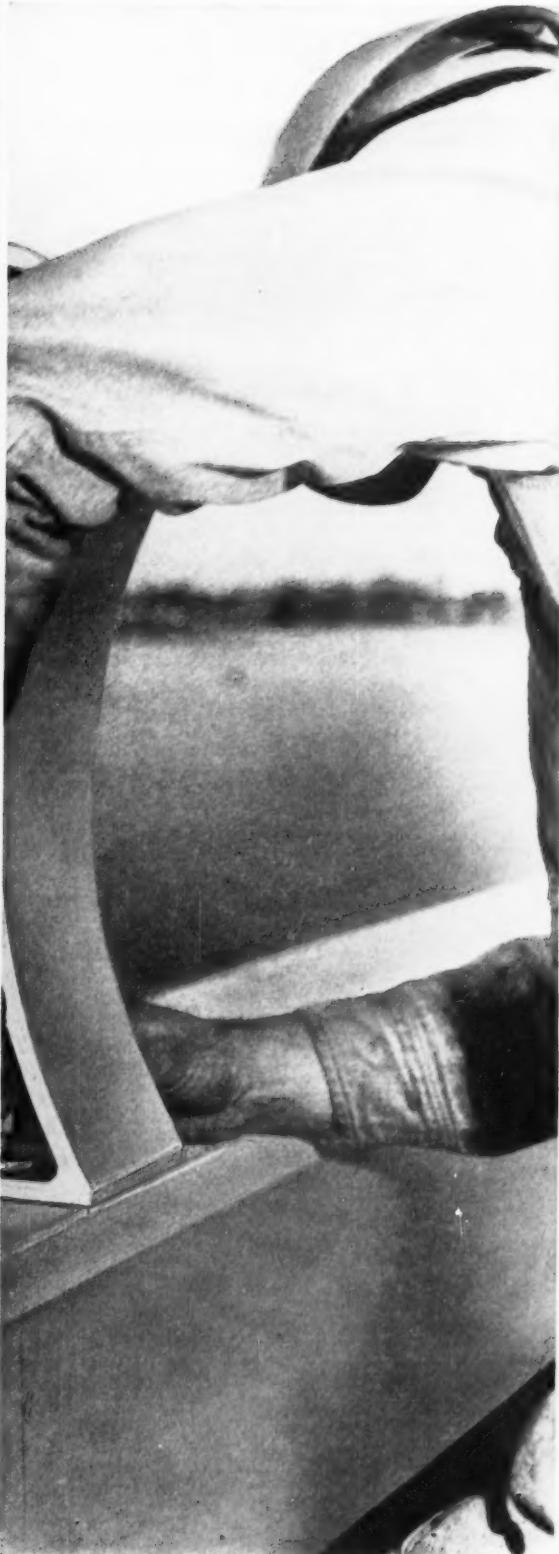
performance records of other Mack users in your area—operators who found out how much they can profit by using the best. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

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The easy part...installing the



Flynn aluminum bridge railing

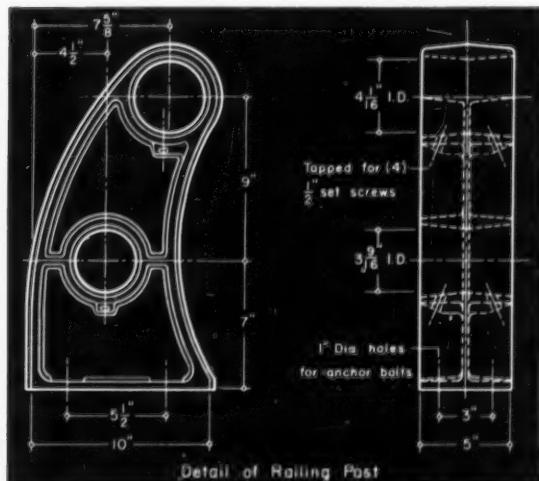


It's light, fast work indeed. One-man crews, armed only with wrenches, can fill your labor requirements at this stage of the job. The reason, of course, is the aluminum components that Flynn makes for modern bridge and highway construction.

There's no need for heavy machinery, cranes, or lift trucks when you use lightweight, sturdy Flynn aluminum parts. And you know the job is complete when the last bolt is tightened. No paint is required, ever.

When your construction schedule is tight, you can depend on Flynn deliveries. And you can be sure that long metallurgical experience at Flynn will provide alloys and cross-sections of maximum strength with minimum weight.

Investigate the wealth of post-and-railing combinations available to you *at low cost* through Flynn's system of standard designs. Then, when you need a complete package (railing, rail seats, posts, anchor bolts, either standard or custom)—ask *Flynn first*.



The post used on the new Hampton Roads (Norfolk, Va.) Bridge is one of Flynn's many standard designs. This and other standard Flynn components are available to you for low cost yet distinctive modern construction.

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FLYNN EXTRUSIONS

Air System Speeds Batch Dumping



SPOTTER flips lever on side of truck body, tripping batch gate to discharge cement and aggregate into big paver skip.

JUST A FLICK of the wrist—and a batch of aggregate and cement pours from a truck into a paver skip. That's how easy a new air-powered batch-gate tripping system is working for L. G. DeFelice & Son, North Haven, Conn., on its big Connecticut Turnpike paving job. There's no lost time waiting for a spotter to climb up on the truck and crank a batch out. Now it's all done in a matter of seconds. And it results in faster dumping with fewer trucks.

Designed and installed by DeFelice on 10 new Mack 12-ton dump trucks, the system operates off the truck's standard 110-cfm air compressor. Air is handled by four reservoir tanks, one under the hood and three under the



PAVING moves fast as big batch trucks feed first of two Koshring Twinbatch pavers. Strike-off screed riding forms is pulled by cables

reeved around paver outrigger and powered off dual-drum gear. Handles lift screed over joints.

Now... **Power Steering**

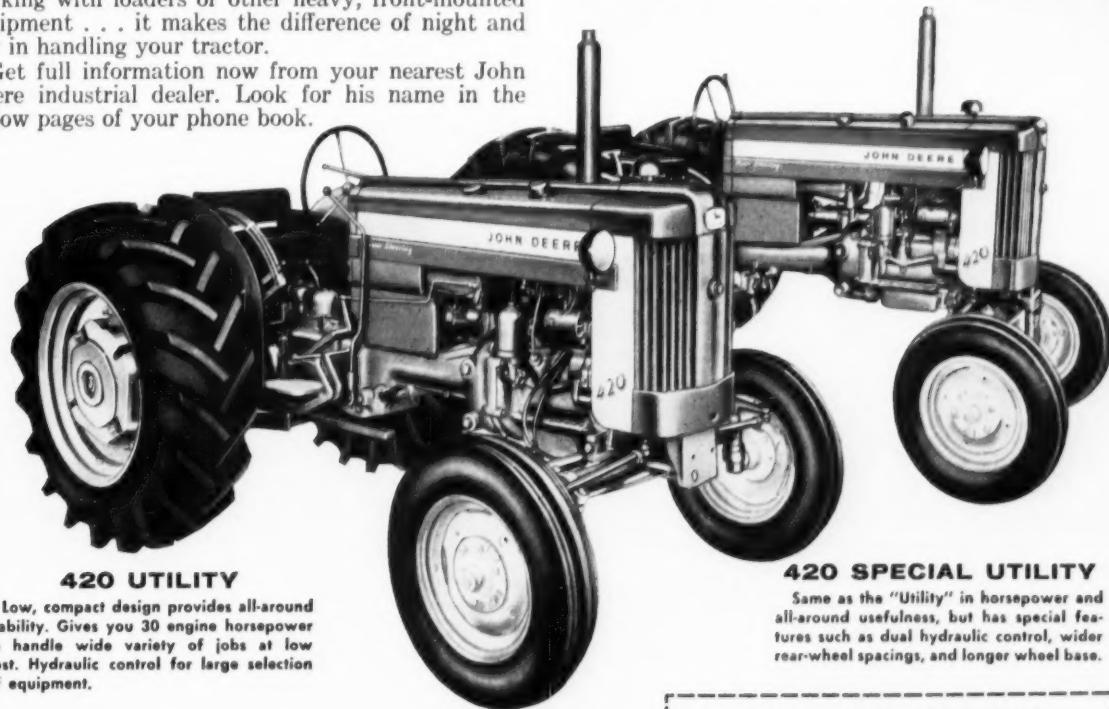
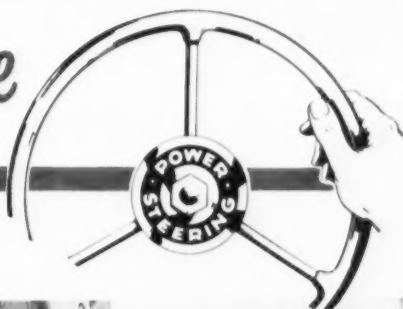
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WHEEL-TYPE TRACTORS

GOOD news for buyers of John Deere "420" Tractors! Now you can get *factory-engineered power steering*. Here is simple, positive, low-cost power steering that means new freedom from driving effort . . . new freedom from driver fatigue . . . safer, faster, more convenient operation.

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Only a test drive can demonstrate fully how John Deere Power Steering will save you time and work, *every time you take the wheel*. In sand or mud . . . when working over rough ground . . . and especially when working with loaders or other heavy, front-mounted equipment . . . it makes the difference of night and day in handling your tractor.

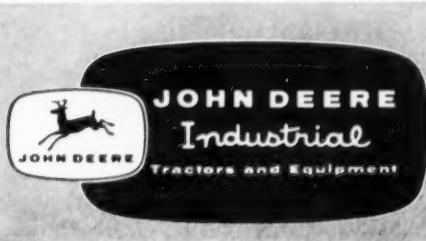
Get full information now from your nearest John Deere industrial dealer. Look for his name in the yellow pages of your phone book.



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Low, compact design provides all-around stability. Gives you 30 engine horsepower to handle wide variety of jobs at low cost. Hydraulic control for large selection of equipment.

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40 years of tractor
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Hydraulic cylinder provides 120° swing, can be indexed for an additional 90° swing.

360° Dump

Hydraulic cylinder provides 90° dump, can be indexed a full 360°.

86° T-Bar Lift

Twin hydraulic cylinders provide T-bar lift of 86° 30', from below horizontal to nearly vertical.



New Remote Control Panel and Driver's Seat—centralized controls provide instantaneous control of swing, dump, T-bar lift, crawler tracks and all drilling operations. Designed for convenience, comfort and safety. Saves minutes and reduces operator fatigue.



New DPAT Hydraulic Drill Positioner—this creep-free hydraulic system maintains alignment at all drilling angles and avoids stuck steel. Provides fast, effortless, power positioning for all vertical, horizontal and flat lifter hole spotting.

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New Model G-2 Bit Grinder—this deluxe "Air Trac" extra saves time, too. No need to send back or wait for bits—you sharpen spare bits on the job. Plus new free-wheeling drive shaft design for towing "Air Trac" . . . tool box for tools, bit and coupling storage.



AIR SYSTEM SPEEDS BATCH DUMPING... continued



AIR CYLINDERS mounted under hoods atop batch gates raise and lower vertical rods that lock and also trip batch gates.

body. Controls consist of four small levers, grouped conveniently at the left rear of the body.

Each truck carries five batches, separated by steel-plate gates, or partitions. The first batch is dumped without controls; it simply discharges when the tailgate is opened. But the other four are dumped by air.

Here's how it's done. Each of the four steel-plate gates is hinged from the top of the body. This permits it to swing open when the body is raised. To control this swinging, each plate is rigged so that its base can be locked in place and then released when the batch is needed. This is done by a movable vertical rod attached to the center of each plate. It fits into a slot in the bed of the truck body, locking the plate. To raise the rod and allow the plate to swing open, a lever is turned by the spotter, causing an air cylinder atop the plate to actuate a simple arrangement of rocker arms which lifts the rod from its slot. The plate swings open, and the batch is discharged. At the same time, the falling aggregate releases its

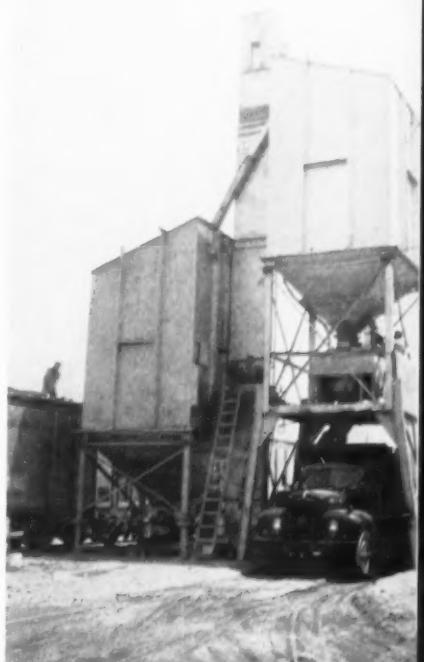
weight against a gate on a cement box mounted on the adjacent plate. The gate opens and the cement discharges right with the aggregate.

This procedure is repeated until all five batches are dumped. When the truck returns to the batch bin, an attendant turns a master three-way valve on the side of the body, and all rods drop into the slots, locking the plates for the next round. Trucks always are loaded first with aggregate to close the cement doors. Then the truck moves to the cement silo, where each cement box is filled through a covered hole in the top.

Compressed air is distributed mostly through $\frac{1}{2}$ -in. tubes, except on top of the plates where it is carried through the 1-in. rods on which the plates pivot. On previous models, DeFelice found that moisture in the air often reacted with infiltrated cement to foul the cylinders. To overcome this in the new rigs, they pass the air through fiberglass filters. The contractor also plans to enclose the piping system on the left side of the body to prevent damage.



THIRD BATCH discharges quickly from body. Compressed air is supplied by Mack truck's standard 110-cfm compressor.



CEMENT is dumped into closed compartments by Blaw-Knox silo. Aggregate is loaded first because it closes cement gates.

NEW YALE G-3



CAPACITIES: 15,000–20,000 LBS.

SERIES

the only high-capacity gas trucks with all three features you need for fast, safe handling of **BIG LOADS**

300% MORE VISIBILITY. "Wide-Angle Vision"—a Yale exclusive! Upright channels are wide-spaced and nested. Hoisting cylinders and lifting chains are right next to channels to reduce frontal obstruction. Fork carriage has only one top, one bottom bar for extra forward visibility at all levels of fork lift. Unique open front design plus high center position of driver provide a wide arc of vision—maximum visibility forward and to the rear for fast, safe handling of heavy loads.

GREATER STABILITY. You get maximum stability under capacity-load conditions—even over soft or bumpy terrain. Center of gravity is low. Underclearance is high. Large, high-flotation tires give plenty of traction. Articulated steering axle, rugged wide-spaced upright design, side-thrust rollers keep loads steady at all points of lift, minimize weaving.

EXTRA MANEUVERABILITY. Short overall length plus 75-degree steer-wheel angularity mean extra-tight turning radius—high maneuverability. Power steering helps driver to move in and out of tight areas fast. For fast cycle operations, these new Yale trucks feature lifting speeds up to 60 feet per minute... fast, controlled lowering...travel speeds up to 20 MPH.

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**INDUSTRIAL LIFT TRUCKS
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The Yale & Towne Mfg. Co., Yale Materials Handling Division
Manufacturing Plants in Philadelphia, Pa., and San Leandro, Calif.

Gasoline, Electric & LP-Gas Industrial Lift Trucks • Worksavers
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New G-3 Series Gas Trucks Have Famous Yale Quality—Premium Engineering Features Included as Standard:

- **For extra strength:** All welded steel frame. H-beam members in frame. Rugged channel construction.
- **For driving comfort:** Hoist, tilt, attachment and gearshift controls are grouped for easy-reach, right-hand operation. Directional control on steering column.
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- **Your choice of Fluid Coupling or standard transmission.** Gasoline or LP-Gas powered models. Wide range of attachments—all engineered for a minimum loss distance.

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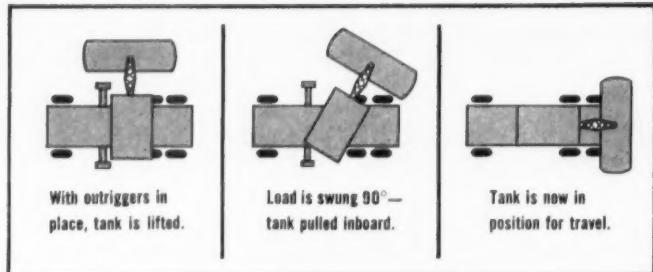
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Because a BAY CITY CraneMobile can be used to transport as well as lift, it's a doubly-handy machine to have working for you. The photo and accompanying sketches show this husky performer, owned by Leach Steel Corp. of Rochester, N. Y., moving one of 60 bulky 17-ton steel tanks. The CraneMobile's extreme stability, power, and balance fit it for dozens of job applications . . . it is a busy contractor's most versatile, most profitable piece of equipment. Available in four sizes with a choice of seven mountings . . . crane capacities from 15 tons up. Call your dealer or write direct for illustrated catalog.



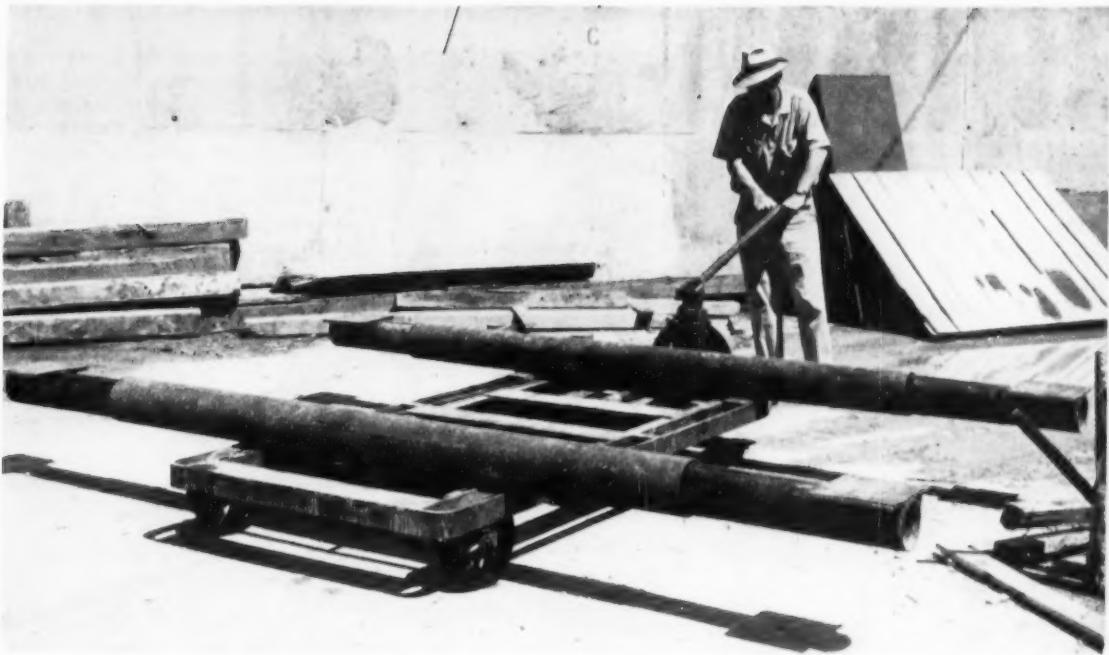
268

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JACK DOLLY ASSEMBLED—Contractor's superintendent, Thomas Heine, demonstrates "Red Giant" multiple stroke hydraulic lift

truck that transports form towers from one pour site to the next to speed pouring of a 10-acre roof slab in Chicago.

Jack Dollies Carry Shoring

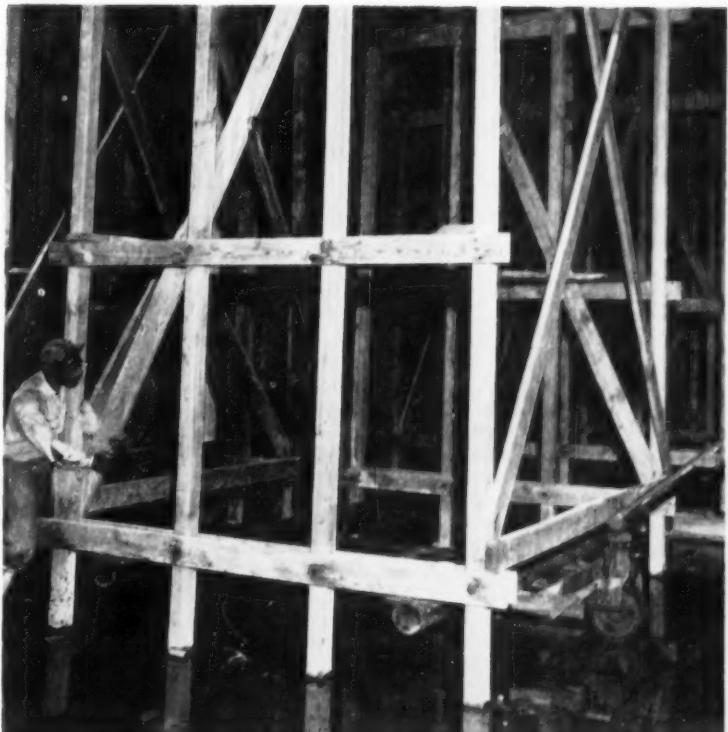
JACK DOLLIES are the key to the speedy erection of 10 acres of concrete roof slab for what will be the world's largest filtration plant.

The dollies support portable timber towers that shore slab forms. A combination of dolly and jack, they make it easy to strip forms and move form assemblies from one pour site to another.

Herlihy Mid-Continent Co. of Chicago has the dollies at work on the \$3.9-million water storage basin portion of the \$90-million Chicago Central District Filtration Plant on the edge of Lake Michigan.

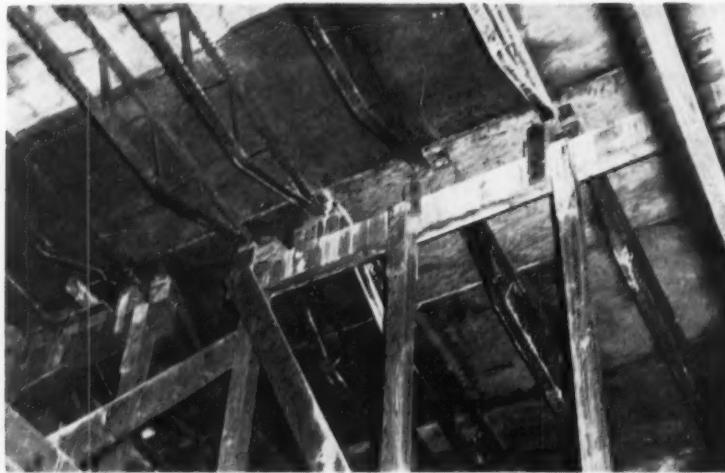
Herlihy's job began with the driving of some 1,000,000 lineal ft of untreated timber piling. They poured an 11-in. concrete slab over the piles and built a series of concrete columns on 23-ft centers to support the roof slab.

Pouring the 10-acre roof slab clearly lent itself to some continuous forming operation. The question was, which type would be best? Herlihy decided to support forms with a shoring system of 238 timber towers that could



JACK DOLLY AT WORK—Workman shakes form tower slightly after it has been set down into place by jack dolly to check whether all tower legs stand securely on the ground slab.

JACK DOLLIES CARRY SHORING . . . continued



JOISTS SUPPORT FORMS—Truscon adjustable steel joists, blocked and wedged up from the top of the tower stringers, form a level and strong support for the plywood decking.



SLAB POUR GOES FAST—By pumping concrete from ready-mix trucks on cofferdam, contractor covers all sections of the slab speedily. Timber chairs speed pipe changes.

be moved with the jack dollies.

Herlihy built two sizes of towers: 124 of them measure 8 x 11½ ft; 114 of them measure 11½ x 12 ft. The larger sizes go around column sections. These towers are worked in 14 clusters of 17 towers each. Herlihy pours 70x70-ft slab sections in a checkerboard pattern to reduce the distance that tower clusters have to be moved after a pour.

Each tower is a framework of vertical timbers cross-braced by 2x4's and 2x6's. Adjustable Truscon steel joists on 12-in. centers go over horizontal ledgers and serve as stringers for the plywood form panels.

The dolly that moves the tower is a rolling multiple stroke hydraulic lift truck called the

"Red Giant." It is made by the Revolvator Co. of North Bergen, N. J. It has four 11-in. dia wheels and measures 96 in. long and 48 in. wide. Capable of taking a 4,000-lb load, the dolly has a maximum jacking lift of 4 in.

Herlihy modified the stock dolly as follows: two 6-in. extra heavy black iron pipes 8 ft 2 in. long were welded across the frame of the dolly 6 ft apart. A 5-in. dia extra heavy pipe was slipped through each end of each 6-in. pipe. Steel plates welded over the end of each 5-in. pipe act as seats for the form tower.

To move a tower, the dolly is lined up with the tower, then moved into place under its lowest horizontal braces. The steel pipes are adjusted so that the

seats come under the lower cross braces of the tower. The cart then is jacked up 1 in., just enough to raise the tower's legs clear of the floor. Three men or a gas-powered concrete buggy pull the towers from one pour location to another.

To position a tower, the jack dolly is retracted, bringing the tower to rest on its vertical posts. Wedges placed under stringer seats and between horizontal ledgers of the tower raise the stringers to the proper elevation. Plywood panels then are placed over the stringers.

After a pour, stripping requires only that the wedges be knocked out causing plywood and stringers to drop onto the horizontal ledgers. The dolly then is moved in under the tower, the tower jacked 1 in. off the ground and moved to a new pour position.

Herlihy pours approximately 90% of the job by Pumpcrete; columns and walls are concreted by crane and bucket.

Personnel on the job include: Charles J. Herlihy, general superintendent; Thomas Heine, superintendent; Walter J. Cahn, structural engineer and designer of the tower-dolly system; George S. Salter, district filtration engineer for the Chicago Department of Public Works; and Arne Anderson, DPW resident engineer on the job.



POURING WALLS—Crane and bucket pouring of walls supplements Pumpcreting.

NEW self-propelled Utility Scraper self-loads 6 yards!



Now you can get a self-propelled scraper sized and priced to help you make a profit on small earthmoving jobs, and cut clean-up costs on big projects

The new Seaman-Gunnison Utility Scraper is designed and priced for profitable earthmoving where you simply can't afford to tie up a big rig. It's equally a timesaver and cost-cutter for clean-up work on big projects.

You move quickly from yard to site, from job to job . . . no permits needed! Simply drive the Seaman-Gunnison Utility Scraper through city traffic or on paved highways under its own power, up to 21 mph. At the job, bite in and heap a self-loaded 6 cu yd. Spread inches-thin or eject the whole load in an instant. If ground is extra hard, lower the built-in scarifier and rip for the next cut!

The new Seaman-Gunnison Utility Scraper for self-loading is powered by an International 650 Diesel tractor, modified as an 88-hp prime mover. At still lower cost, get an International 65 hp W 450 Diesel prime mover, and push-load in difficult soils. All steering and scraper controls are hydraulic. You can turn 180° in 22 ft, 2 inches. Overall width and axle loadings are well within limitations for self-transport and hauling on streets and highways. WRITE, WIRE, or PHONE for descriptive folder and name of your Seaman-Gunnison Construction Equipment Distributor.

Team the Utility Scraper (interchangeable W 450 prime mover) with a Seaman-Gunnison DUO-PACTOR, giving you the lowest cost system ever devised for utility earthmoving, compaction, surface rolling, and seal coating!

Utility Scrapers and Duo-Factors are developments of Harry J. Seaman, pioneer in soil stabilization equipment and techniques for more than 20 years, and are manufactured only by Seaman-Gunnison Corporation.

SEAMAN

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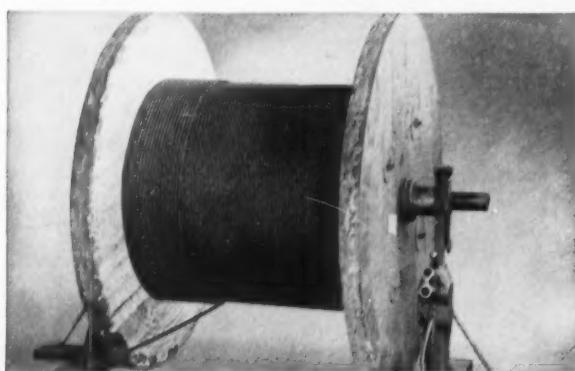
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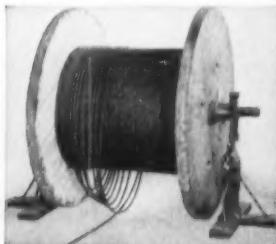


Tuffy[®] Wire Rope Tips



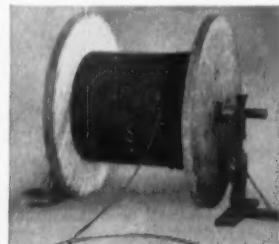
Here's the way to set up reel for unwinding

The stock reel should be set up on jacks, so the rope will come from the under side of the reel as shown in this picture.



This reel is set up right

Unwinding has started, and the reel is spinning faster than the rope is being pulled off. But because it's coming from the under side of the reel, the rope is simply loosening on the reel, with no damage.



This reel is set up wrong

The rope is coming from the top of the reel and forming loops as the reel over-runs. These loops are likely to form kinks and dog-legs, which can be ruinous to rope life.

Tuffy Special Wire Ropes are tailored to special use. Ordering is easy:



Tuffy Scraper Rope

It's flexible enough to withstand sharp bends, yet stiff enough to resist looping and kinking when slack. Moves more yardage per foot because it's specially built to take the beating of drum-crushing abuse.



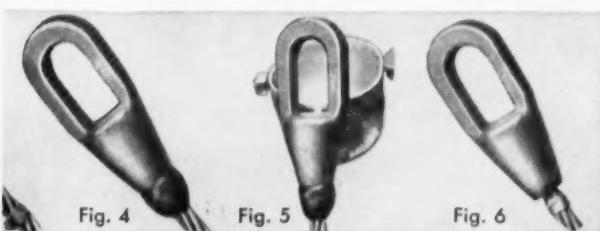
Tuffy Dragline Rope

Constructed to give you maximum abrasive resistance with super flexibility. Rides smoothly on grooves, hugs the drum when casting for full load. Consistently dependable in handling any material — wet or dry dirt, sand, gravel, rock, cement or minerals.



Watch your steps

when you unwind, seize, clip, socket and reeve wire rope



4. Dip the wires in boiling water containing a small amount of soda, to neutralize the acid.

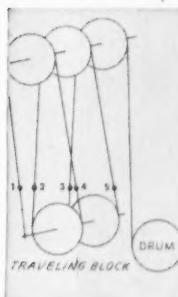
5. Place a temporary tie wire over the ends of the cleaned wire (see Fig. 3). Be careful not to get the cleaned wires greasy or oily.

6. Insert the rope end into bottom of socket. Remove temporary tie wire.

7. Holding the rope vertically in a vise, set the socket so that the wires are flush with top of the socket basket and seal the bottom with putty or clay (Fig. 4). Pour in among the wires about $\frac{1}{2}$ teaspoon of sal ammoniac crystals.

8. Pour molten zinc into the basket to fill (Fig. 5). When zinc is solidified, remove seal. Socketing is complete as shown in Fig. 6.

REEVING



Reeving ropes through the sheaves multiplies the number of parts supporting the load. The lead line to the drum carries the weight of the load lifted, divided by the number of parts, plus the accumulation of friction on all sheaves.

Here's how to count the number of parts supporting the load. Draw an imaginary line across the parts of the rope supporting the load.

The efficiency of reeving systems ranging from one to eight parts is shown in charts which Union Wire Rope engineers make available to users.

Attaching by CLIPPING



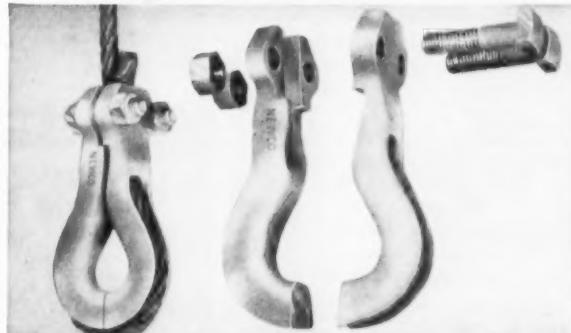
RIGHT WAY for greatest rope strength



Wrong Way: clips staggered



Wrong Way: clips reversed



The fitting you use on wire rope can handicap it or enable it to work at full efficiency. Fittings which derive holding power from crimping action are harmful to the rope. Shown here is a clamp that has no wrong side—can be put on either way. It snugly saddles the rope, grips larger surface area in such a way that loads are carried almost solely by friction rather than by crimping action. Combined in its two parts is a thimble and the parts are interlocking to prevent collapse of the thimble and to eliminate all shear on the bolts.

Just say **Tuffy** give length and size, and forget complicated specifications.

Tuffy Slings and Hoist Lines

Here's the team that does a topflight job with every type of materials handling. **Tuffy Slings** are made of a patented, machine-braided fabric; stays extra flexible; can't be hurt seriously by knotting or kinking. **Tuffy Hoist Line** is a special construction of super flexibility and toughness.

Tuffy Dozer Rope

Constructed to give you longer service life with less downtime, 150' reels of $\frac{1}{2}$ " or $\frac{9}{16}$ " mounted on your dozers allow you to cut-off worn sections without wasting good rope. Put Tuffy Dozer Rope on the job and watch costs go down!



Ready Help in Your Wire Rope Problems... ASK YOUR UNION DISTRIBUTOR

Whether your wire rope need is a scheduled replacement or emergency requirement, your Union distributor is ready with "right-now" service. He keeps complete warehouse stocks of Union standard constructions and the Tuffy special purpose ropes. And he's backed by immediate service from his nearby Union Wire Rope depot.

If it isn't rope you need, but advice on a wire rope problem, he's just as ready to help. Just say the word!

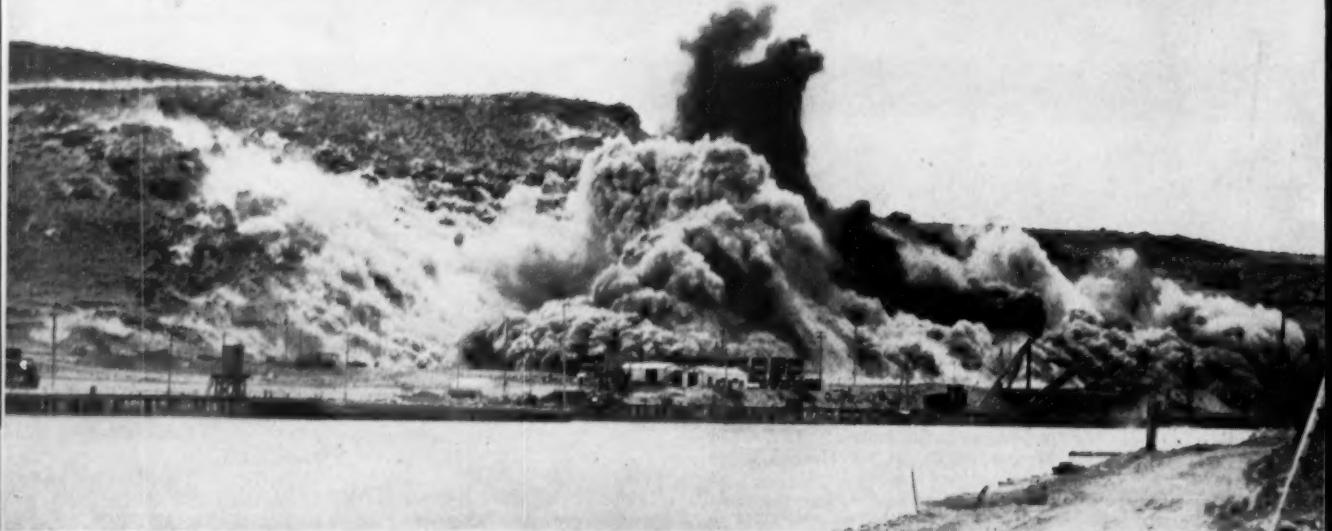
If you don't know him already, see your classified telephone directory, under Wire Ropes or Slings.

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Giant Blast Shatters Cliff



Months of careful planning and preparation make the biggest blast in construction history also one of the most efficient. With a minimum of wasted energy, the shot produced 2,000,000 yd of rock fill in manageable sizes for the 13-mi causeway across Great Salt Lake.



LOADING — Conveyor delivers explosives to 40 pockets cut in walls of crosscut tunnels.

200-Ft. High



DRILLING — Jumbos drive four crosscut tunnels 600 ft long.



MUCKING — Mine cars on narrow gage track haul out shot rock.



FUSING — Experts lace two detonating fuse trunks into cartridges in pocket.



STEMMING — Specially designed small conveyor packs four tunnels with sand.

THE LARGEST non-atomic blast ever fired was a straightforward coyote-hole shot that produced 2,000,000 yd of rock fill for the 13-mi causeway Morrison-Knudsen Co. is building across Great Salt Lake for the Southern Pacific Railway (CM&E, Mar., p. 60).

There was nothing unusual about the big blast except its size. Still, it took months of careful planning and preparation to bring it off with maximum efficiency and safety. Just driving 2,400 ft of crosscut tunnels required 100 working days. It took another three weeks to pack in the 1,790,000 lb of explosives.

Site was a 200-ft-high cliff on Promontory Point, a narrow peninsula on the north shore of the lake. M-K crews drilled two 5x7-ft entry portals 1,300 ft apart into the cliff. And from each adit they drove two 5x7-ft crosscut tunnels 600 ft into the heart of the cliff.

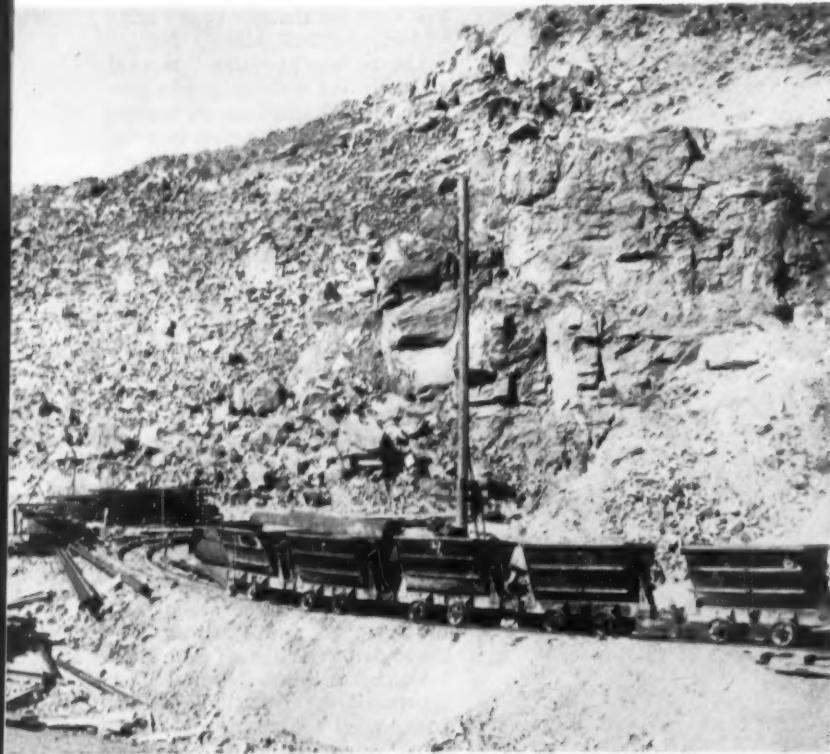
The first pair of crosscut tunnels was 85 ft from the portal; the second was 170 ft in. Crosscuts did not connect. There was 60 ft of rock between the ends of the first pair and 40 ft between the ends of the deeper pair.

Tunnel driving was standard. Gardner-Denver drifters on jumbos drilled "V" cuts and occasional hammer cuts. Rounds, loaded with sticks of Atlas 40%

GIANT BLAST SHATTERS CLIFF... continued



THE PAY OFF — Shovel with 6 1/2-yd dipper easily loads well broken rock in muck pile.



A NEW SHOT — Mine cars line up to enter undamaged portal and start next crosscut.

and 60% Giant Gelatin, pulled an average of 5 ft. Eimco muckers and mine cars operating on narrow gage tracks removed muck.

Explosives were hand loaded from mine cars into 40 separate pockets cut at 50 to 60-ft intervals in the four crosscuts. In general, a charge consisted of 80% Atlas Amocol, a low-order nitro-carbonate blasting agent, and 20% Atlas 60% Extra dynamite in 50-lb cartridges.

But each charge was calculated individually and varied according to the extent and character of the burden. Loading averaged 51% to 61% heavier in the deeper crosscut.

Primers were 50-lb cartridges laced with detonating fuse. The remainder of the dynamite cartridges in each pocket was distributed among the Amocol bags to assure complete detonation of the pocket.

Loading began with the deepest pocket in each crosscut. Then the tunnel was backfilled with sand to the next pocket. A screw-equipped hopper hauled sand into the tunnel and augered it on to a 15-ft inclined belt conveyor that delivered it to a specially designed small conveyor. Mounted on rubber-tired wheels, this rig moved from side to side, slinging the sand to the roof of the tunnel and packing it between pockets.

When the last charge had been placed, each crosscut was stemmed with a minimum of 130 ft of sand between its last pocket and the juncture with the adit. This protected the adits from damage by the shot and made it possible for work to begin immediately on additional crosscuts.

Two separate trunks of detonating fuse in each crosscut and a "jumper" at every third pocket provided insurance against misfired charges. Zero delay Atlas caps detonated the four fuse trunks in the first pair of crosscuts, and 25 millisecond delay caps fired the deeper pair. All eight caps were connected in series to heavy gage leading wire. The shot was fired with 220 line voltage from 3,000 ft. away.

The \$49 million causeway project is under the general supervision of James N. Wells, an M-K vice president. Guy Read is M-K's project manager. Technical representatives of Atlas Powder Co. assisted in planning and executing the blast.

How to pave with ASPHALT

Kentucky highway's 11-inch Texaco Asphalt pavement includes insulation course, base and wearing surface



Road-mixing Rapid-curing Cutback Asphalt and aggregate for 2-inch insulation course on traffic bound subbase.



Laying hot-mix Texaco Asphaltic Concrete on 18 miles of US Route 62 near Paducah, Ky.

The heavy-duty Asphalt pavement designed by Kentucky engineers for 18 miles of US-62 is one of a number of designs effectively used for major highways throughout the country.

Kentucky covered the traffic-bound subbase with a 2-inch insulation course, consisting of Rapid-curing Cutback Asphalt and aggregate, mixed on the road by blade graders. This was followed by a 6-inch "black base" of coarse-graded, plant-mixed Texaco Asphaltic Concrete. To complete the pavement, a 3-inch surface of plant-mixed Texaco Asphaltic Concrete, using smaller aggregate than in the base, was laid in two courses.

This 11-inch Texaco Asphalt pavement on a traffic-bound subbase is suitable for heavy interurban, municipal and airport traffic. Its cost is substantially lower than that of rigid paving with the same load-bearing capacity. Its resilience and freedom from joints insure maximum driving comfort for motorists, less wear and tear on vehicles. Its dark color eliminates glare, makes traffic lines stand out more sharply, causes snow and ice to melt faster.

Helpful information on methods and materials recommended for all types of Asphalt road and street construction, from heavy-duty paving to low-cost surface-treatment, is supplied in two Texaco booklets. Copies may be obtained without obligation from our nearest office.



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THIS JOB IS SAFE—Project safety director Jim Regan looks over the job where men have worked nine months without an accident. It

is the \$27-million Grasse River Lock under construction on the St. Lawrence Seaway by a Perini Corp. sponsored joint venture.

Safety Saves Lives—and Dollars

HEADS UP SAFETY practises on a \$27-million St. Lawrence Seaway job have resulted in nine continuous months of work without a single disabling accident.

The record belongs to Perini Corp., sponsoring contractor of a joint venture building the Grasse River Lock. Besides pushing the job ahead of schedule—it's one of the few jobs on the Seaway not running behind—Perini's safety practises are saving him \$500,000 in wages, workmen's compensation, and other factors.

The job is a tough one that makes the safety figures hard to believe. Grasse River Lock near Massena is located at the east end of the 10-mi Long Sault Canal. The lock is an intricate pattern of high and bulky concrete walls that make working difficult.

"Phenomenal" is the term given the accident-free period by F. W.



CHECKING UP—Lou Perini (center) discusses safety progress with insurance company expert (left) and a number of "watchdog" committee formed to enforce safety rules.

SAFETY SAVES LIVES—AND DOLLARS... continued



GET THE MESSAGE?—Workman polishes off safety message on carrier placed across bottom of gantry to discourage men from ducking under giant crane while it is in motion.



DOUBLE LADDER—Oversized work ladder used on job has a center divider built into it. This permits workmen to climb or descend it without danger of bumping each other.

Braun, vice president in charge of accident prevention for Employers Mutual of Wausau, a firm that carries 90% of workmen's compensation insurance on the Seaway.

"In an earlier era," says Frank Boodro, Perini's safety director, "at least 27 workmen would have been killed before completion of the lock—or, a life for every million dollars worth of construction."

Only One Death

To date, there has been only one fatality on the job and an almost unprecedented record of nearly nine months without a disabling accident.

Reasons for the fine record, both insurance and contractor officials agree, is a combination of preplanning on the job and good teamwork between labor and management.

Perini Corp., working with union representatives, has developed an efficient method of checking safety observances.

Eight labor stewards form a sort of "watchdog" committee to make sure that this workman isn't throwing debris from a catwalk, or that workman isn't walking around without a hard hat on his head. The eight stewards are distinguished only by a small white badge with a green cross pinned to their chests.

They reprimand workers who neglect the rules and make recommendations for more drastic action as necessary. They meet on company time and are "docked" if they don't have a sound excuse for missing a meeting.

Weekly Meetings

Once a week they meet with Perini representatives and the insurance company's accident prevention engineer to discuss better ways to do the job. Recently, they decided that one way to draw greater attention to accident prevention would be to attach a safety message to the next pay check—something every workman is bound to see.

Another device for keeping workmen safety conscious is indoctrination lectures for new workers. Whenever a new crew is hired company officials give the men a straightforward lecture on how much the proper observance of accident prevention can mean.

"Our biggest problem," says project safety director Jim Regan, "was coming in here and hiring workmen who had no experience at all in construction work."

The safety indoctrination talk was an important factor in fitting a man to his job. Pre-planning safety measures for the mammoth job also is a major factor.

Meeting of Minds

During a period of several months before work on the lock was started, insurance representatives met with Perini officials to discuss methods and techniques of operation that would reduce the possibility of accidents.

One of the ideas that came out of these meetings was a decision to attach catwalks with handrails to the sides of concrete forms where men would be working at great heights.

Another idea was attaching bars below the bottom frame of the two huge gantry cranes so that men wouldn't be tempted to duck under the crane while it is in motion on the rails. The wooden bars also carry this message: "Be Alert—Stay Alive."

Still another idea helping protect workmen is the use of a single work ladder extra wide with a divider strip running down its center. These were introduced to discourage workers from climbing around each other on a single ladder. They are not meant to be used by two people at the same time except for the climbing around process.

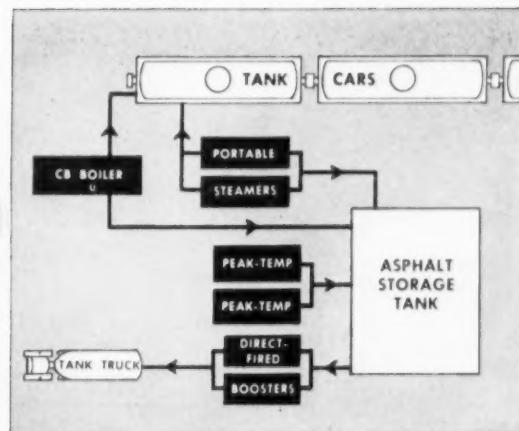
Safety-Staffed Job

Perini keeps a full time safety engineer and assistant on the job. There is a first aid trailer with a registered nurse. Accident reports are sent to the Corps of Engineers, the insurance carrier, and the home office safety department so that all three may know where trouble spots lie and work together to prevent repetition of an accident.

Perini's safety program at the Grasse River Lock pays off in two ways: (1) A saving of half a million dollars in workmen's compensation and related costs; (2) Keeping ahead of the work schedule.

Lou Perini, president of the company, recently was awarded the National Safety Council's Honor Award, and Employers Mutual's top award for safety.

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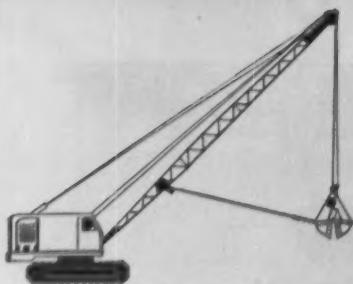
PORTABLE STEAMER—50 to 125 hp. trailer and skid-mounted.



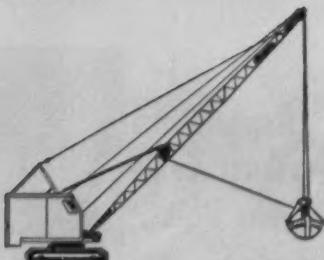
PEAK-TEMP OIL BOOSTER—Skid-mounted. Easily transported.



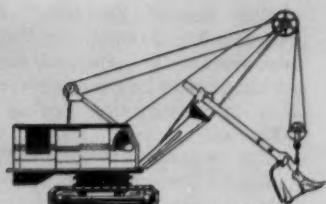
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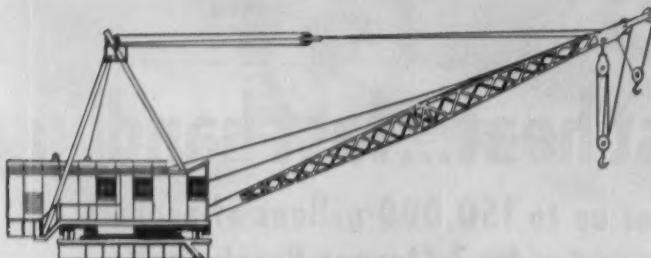
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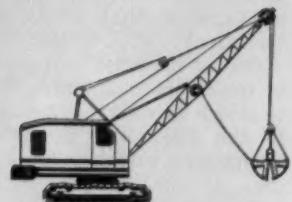
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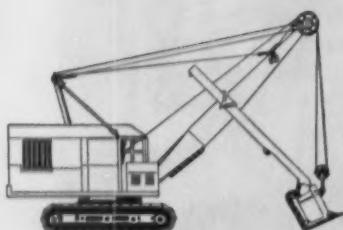
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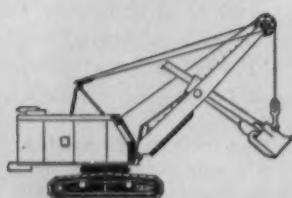
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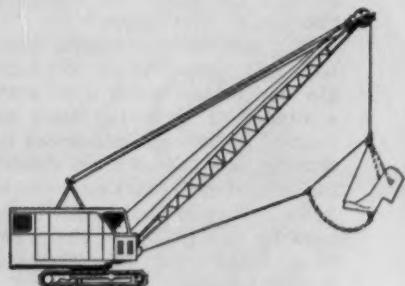
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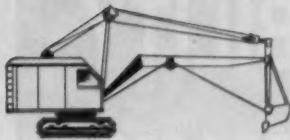
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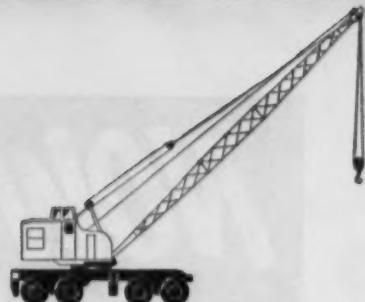
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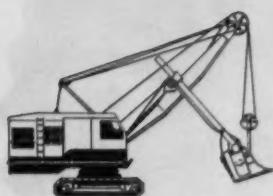
Dominion



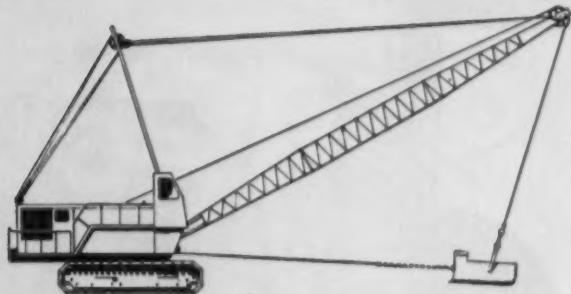
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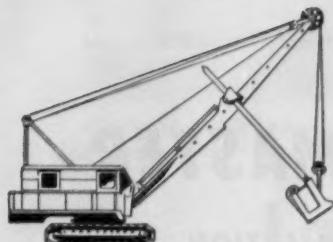
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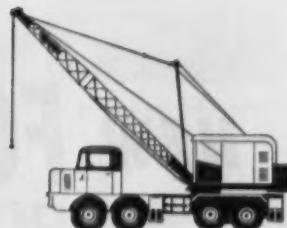
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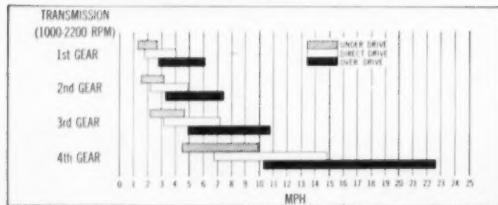
Accessories — bumper and wheel weights.

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ROADWAY TRUSS, here partially complete, is last major phase of Mackinac Bridge erection. Framework is fabricated on shore

in 120-ft sections. Sections are barged to position under cables and lifted into place by hoists riding on main cables.

Last Steel at Mackinac

AT MACKINAC STRAITS the world's longest suspension bridge has been taking shape for three years. But it didn't look much like a bridge until steel erectors, in a dramatic amphibious operation, hung the roadway stiffening truss from the main cables.

The job is part of the \$45 million contract for the super-structure held by U. S. Steel's American Bridge Division. The complete bridge will cost \$100 million.

When this phase started, the two main towers were up and the cables, complete with suspender ropes, were in place. The last big job for American Bridge was to erect the roadway truss.

American decided to build the truss in sections on shore, barge the sections into position, and hoist them into the superstructure.

The 100-ton units were assembled at the St. Ignace yard from components fabricated in the company's Ambridge, Pa., and Gary, Ind., plants. The 86 units required 2,200 such members. Finished units were 120 ft long, 70 ft wide, and 40 ft deep.

The barging operation was no great problem, but it was attempted only when weather and water conditions were perfect. Continuous Coast Guard radio broadcasts kept passing ore boats at a safe distance.

Erection

The tricky part of the job was lifting the units nearly 200 ft from the barge to the roadway level.

For stability each unit required four hoists. Supported entirely on the 24½-in. main cables, the hoists operated independently

of each other. They were powered by engines at the base of the main tower.

Crews communicated by radio and telephone. Directing the operation was an observer on the upper superstructure. He kept in constant contact with barge men and hoist operators during the lift.

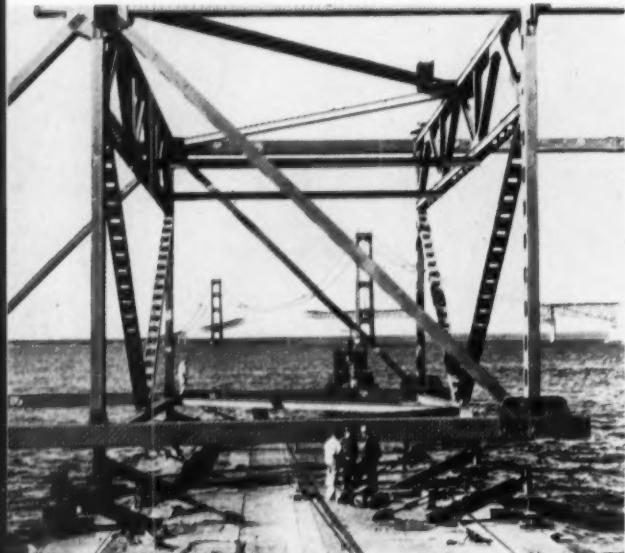
To keep the unit rising evenly, 10-ft levels were fastened to the top of the truss unit, and the observer used them to co-ordinate the hoists, whose operators were too far away to see what was happening.

As each truss unit moved into position, bridgemen fastened it to the suspender ropes and to the adjoining unit. Although each unit is 120 ft long, it adds only 80 ft to the length of the roadway because of a 40-ft overlap.

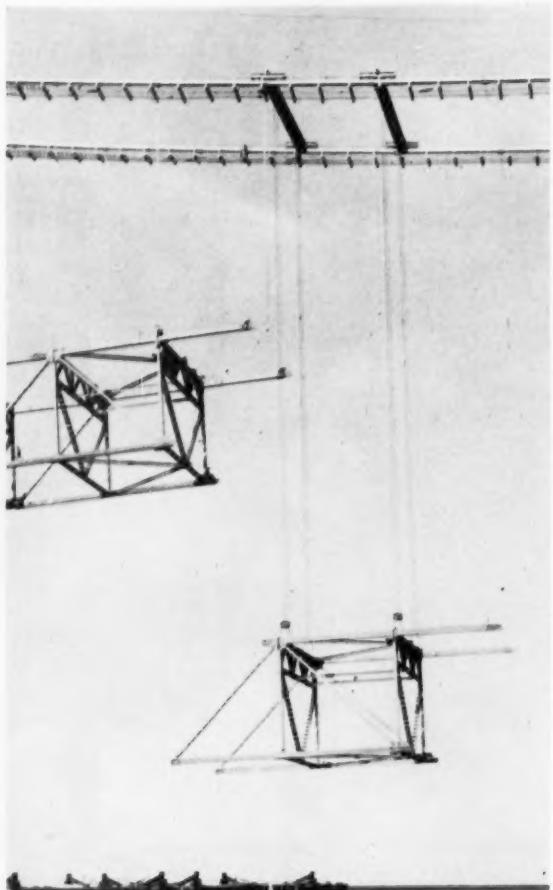
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LAST STEEL AT MACKINAC ...

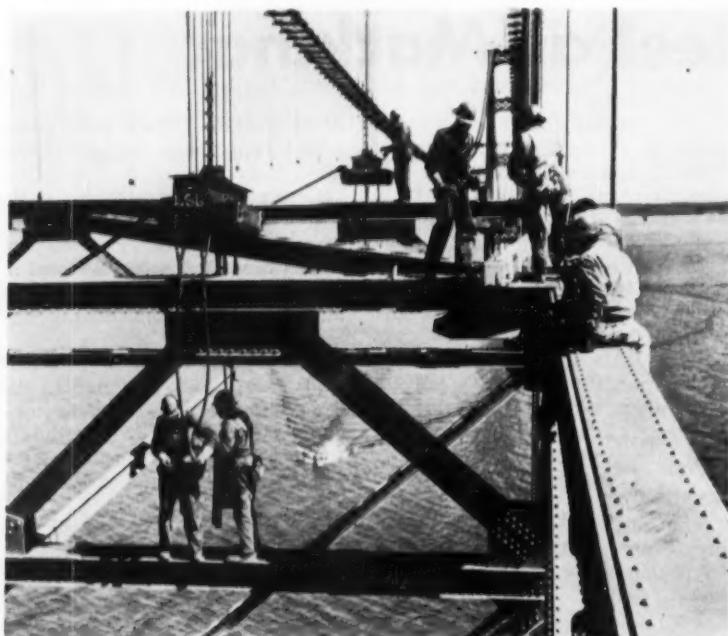
Barge and Hoists Place Span's Roadway Truss



BARGE carries a single truss unit from shore fabricating yard to bridge. Capacity of barge is two 100-ton units.



FOUR SEPARATE HOISTS, supported on main cables, lift unit into place from anchored barge. Weather conditions must be perfect.

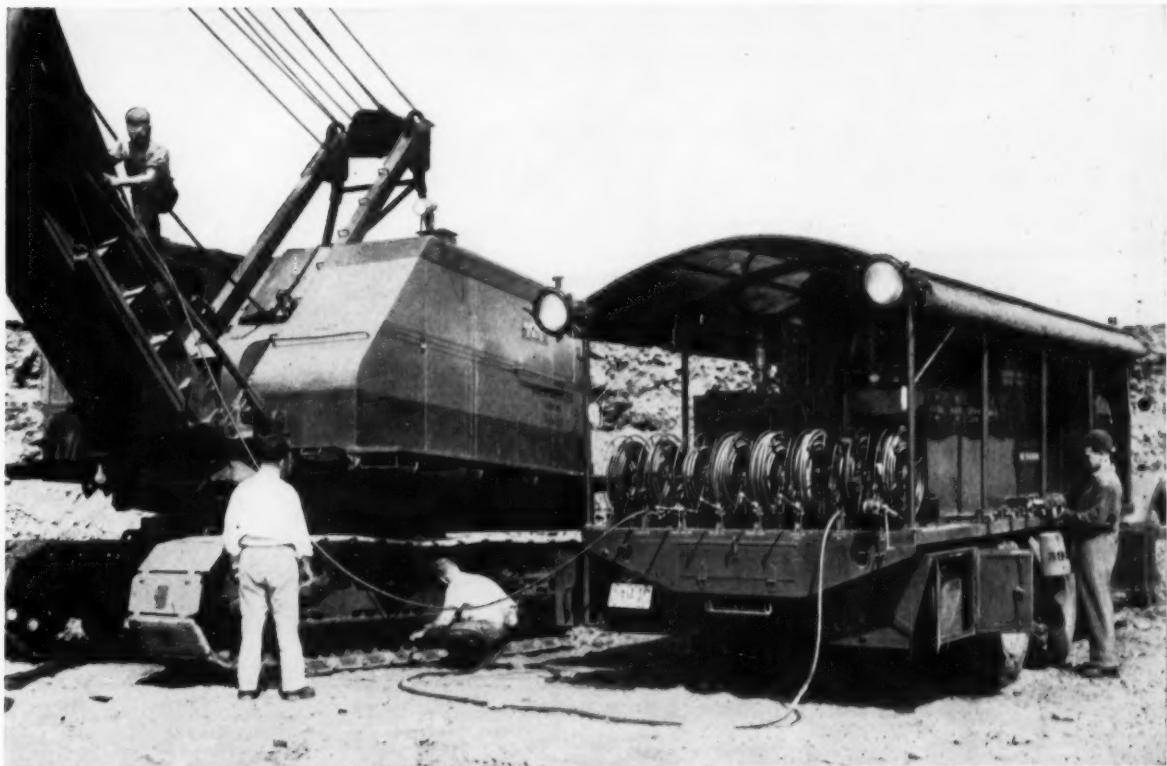


TRUSS UNIT is now in place, and bridgemen are connecting the suspender ropes to sockets in the top chord of truss. Other men are unfastening the hoists.

The roadway still has to be paved, and Merritt-Chapman & Scott, the substructure contractor, has to touch up the anchorages with 85,000 cu yd of concrete. But by November, traffic should begin to roll across the new bridge.

The Mackinac Straits project has made bridging history. It is the longest suspension bridge in the world—8,614 ft between anchorages. Its 3,800-ft center span is second only to the Golden Gate's 4,200 ft. And it culminates 17 years of pioneering research, started after the Tacoma bridge failure, into the effects of wind forces on large bridges. The Mackinac bridge is designed to be safe under all conceivable wind conditions.

For years, bridging the Straits of Mackinac was considered impossible because of the long span, great depth of channel, and severe ice and weather conditions. But imaginative designers and big league builders will soon check off another "impossible" job as completed on schedule.



This lubricating truck was designed and built by Brewster for high-pressure on-the-site lubrication and fueling of equipment.

Geo. M. Brewster & Son, Inc.

relies on ESSOLUBE HD for cleaner engines, greater power, longer life

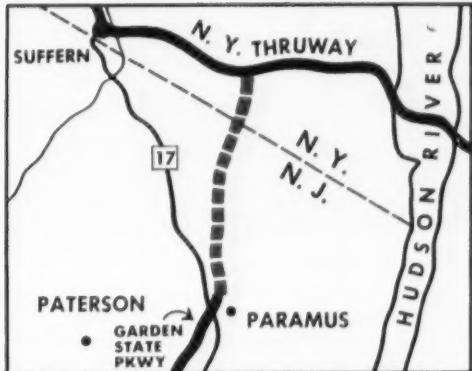
Essolube HD was specified for Brewster's 85 pieces of construction equipment used on the Spring Valley-Paramus Connecting Link job. (In their new Caterpillar supercharged diesels, Brewster uses Esso Estor D-3.) Brewster noted outstanding internal cleanliness resulting in better engine efficiency and economy, prolonged engine life.

What's more, Essolube HD cuts Brewster's handling and inventory since it is being used in both diesel and gasoline engines. And there's never any danger of using the wrong lubricant.

Brewster is using Esso fuels and lubricants *exclusively* on the Spring Valley job. Result: maximum power, fewer breakdowns, longer engine life for all equipment.

More and more contractors are finding out that in any equipment, on any job, under any operating conditions...it pays to specify *Esso*.

For more information, contact the nearest Division office of Esso Standard Oil Company: Boston; Pelham, N. Y.; Elizabeth, N. J.; Bala-Cynwyd, Pa.; Baltimore; Richmond; Charlotte; Columbia, S. C.; Memphis; New Orleans.



A vital link between New Jersey's Garden State Parkway and the New York Thruway is being built by Geo. M. Brewster & Son, Inc. It's a 4-lane 3½-mile highway.

For better results . . .



**PETROLEUM
PRODUCTS**



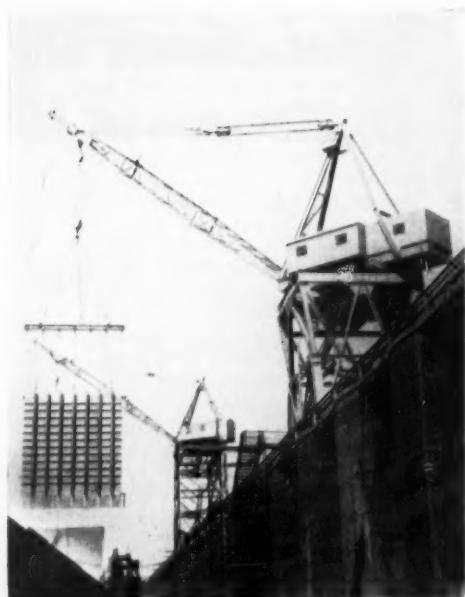
At the huge dry dock of the New York Shipbuilding Corp., construction is now under way on the 60,000 ton aircraft carrier, the "Kitty Hawk." For this tremendous construction project the two new, 80 ton Whirleys, shown in the center of this illustration, were added to the existing fleet of Clydes.

\$120,000,000 construction project uses five Clyde Whirleys

With a four acre flight deck one-fifth of a mile long and an overall height equal to a twenty-five story building, this \$120,000,000 construction project requires a tremendous amount of material handling know-how. Placing 52,000 tons of structural steel, 1,000 tons of aluminum, 180 miles of piping, 290 miles of cable . . . keeping materials moving on schedule . . . this is the assignment handed the five Clyde Whirleys by New York Ship.

Clyde's full revolving, self-propelled Whirleys have an established reputation of easiest, safest handling . . . equal load distribution on the fully supported turntable . . . a work-capacity that knows no equal! That's why Clyde Whirleys are preferred on major construction projects, at rail transfer terminals, for extra heavy cargo handling at leading ports around the world.

Whatever your material handling problems, it will pay you well to investigate the complete line of Clyde's performance-proved Whirleys, Hoists, Derricks, Whirlettes, Car Pullers, Unloaders, and deck and dock material handling equipment. The use of Clyde's Engineering Department is yours without obligation.



CLYDE IRON WORKS, Inc.
Established 1899
DULUTH 1, MINNESOTA

HOISTS : DERRICKS : WHIRLEYS : UNLOADERS
BUILDERS TOWERS : CAR PULLERS : ROLLERS

Construction Men in the News . . .

Savins Start New Business In Hartford

HERBERT C. SAVIN and PETER M. SAVIN, sons of A. I. (Butch) Savin of Hartford, Conn., have organized a new construction company under the name of Savin Brothers, Inc. The firm will operate out of Hartford.

Herbert will serve as president and Peter will be vice president and treasurer. Both formerly were active with their father in the Savin Construction Corp. of East Hartford, recently made a division of the Merritt, Chapman & Scott Corp. construction department. Herbert also was a vice president of MC&S. Both have severed connection with that company.

The new company will be operated as an entirely separate firm with no connection to the

Savin Construction Corp. It will engage in highway and heavy construction throughout the New England and New York area. The firm's first job will be a 3.6-mi expressway section between Windsor and Windsor Locks, Conn. The contract will run about \$3.8 million.

Herbert is chairman of the Connecticut Labor Relations Division of the New England Road Builders Association; Peter is a director of the Connecticut Road Builders Association.



C. H. FERGUSON will become manager of the San Francisco regional office of Intrusion-Pepakt, Inc., Cleveland concrete construction contractors.

Ferguson joined I-P in 1952 as regional engineer in the Seattle office. In 1955, he became district manager. He previously had served six years with the U. S. Corps of Engineers.

THOMAS L. ENGLISH will become general superintendent of construction for the Rust Engineering Co. of Pittsburgh, Pa. English has been assistant general superintendent for three years; he succeeds N. K. Steenhill who will become a project manager for the company. English has been with Rust since 1940. He started as a field engineer and later became a field superintendent.



RUSSELL T. BRANCH, chairman of the board of Stone & Webster Engineering Corp., a New York and Boston engineering and construction firm, will retire after 45 years of continuous service.

Branch was elected chairman in May, 1955. During World War II, as executive vice president of the firm, he was in charge of the engineering and construction of the Manhattan Atomic Project in Oak Ridge, Tenn.

He joined the firm in 1912 on graduation from Stevens Institute of Technology. During the following years he worked on many power, chemical, petroleum, and nuclear projects engineered and built by Stone & Webster. He was vice president and senior construction manager from 1933 to 1945 when he was elected president of the company.



DAVID O. MCKINLEY is a new vice president of Aberthaw Construction Co., Boston, Mass. McKinley joined Aberthaw in 1955 as chief estimator. He has been in construction 15 years. McKinley previously served with Charles Logue Building Co. and Turner Construction Co. He is a civil engineer graduate from Pennsylvania State University.

JOHN A. TANTILLO, construction superintendent for Corbetta Construction Co., Inc., for the past 11 years, is project manager for the \$18-million U. S. Naval base under construction at Rota, Spain.

The job is being done by a joint venture of Corbetta and Construcciones Civiles, S. A. of Spain. Tantillo had been project manager for Corbetta's rebuilding of Drydock No. 3 in the

CONSTRUCTION MEN IN THE NEWS... continued

Brooklyn, N. Y., Navy Yard. He will be succeeded in the post by James B. Lytle, who directed construction of the last three miles of the New York State Thruway in Yonkers, N. Y.

JOSEPH S. MYERS will become assistant vice president of Merritt, Chapman & Scott Corp's construction department. He will report to William Denny, execu-

tive vice president of that department.

Myers, associated with MC&S for 11 years, has served since January, 1954, as a vice president of MC&S Overseas, Inc., a subsidiary working on foreign construction. A specialist in marine and heavy engineering and construction, he has been responsible for direction of pipeline projects and other construction in Australia, India, and New Zealand.



the sight is right

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7015 ENGINEERS' TRANSIT—Engineers, heavy contractors and surveyors have found the David White transit ideally suited to their various needs... highways, bridges, roads, mines, forests, sewers, subdivisions, dams, farms and city surveys and large construction projects. The magnificent optical system provides a clear, sharp, flat image. The sterling silver circles are precisely cut by a dividing machine with a tolerance of one second of arc. These and a host of other design and operation features combine to give you a transit unsurpassed for ease, accuracy, economy, and long dependability in the field.



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7180 Engineers' 18-Inch Dumpy Level—for profile leveling, taking cross sections, setting slopes and grade stakes, sewers, etc. Retails at \$359.00



8300 Universal Builders' Level Transit—for heavy-duty work in connection with all survey and check-up operations on building and road construction, etc. Retails at \$187.00



8200 Construction Transit—ideally suited for work in connection with highways, bridges, roads, mines, forests, sewers, subdivisions, dams, farms, city surveys. Retails at \$345.00

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INSTRUMENT COMPANY**

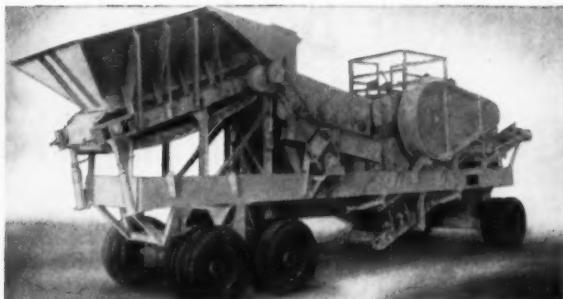
2051 North Nineteenth Street, Milwaukee 5, Wisconsin

A. E. SOMERVILLE (top) will manage all construction operations for Arthur G. McKee & Co., Cleveland engineers and contractors.

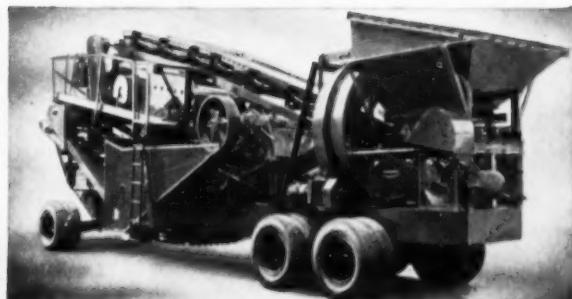
R. G. WIDMAN (bottom), a McKee construction superintendent, becomes assistant construction manager.

Somerville succeeds the late James H. Sharpe with whom he worked for several years as assistant construction manager. He has been closely associated with the construction industry for the past 25 years and has been with McKee since 1940 as assistant construction superintendent, general superintendent, and assistant project manager.

Widman joined the company as a field engineer on his graduation in 1948 from the University of Michigan. He was promoted to construction superintendent three years later.



PRIMARY PLANTS: Use with Intermediate and Secondary Plants or alone for producing ballast. Jaw crushers 1524 to 3042 in size. Choice of portable apron or built-in feeder. Some have scalping screen ahead of crusher.



IN-LINE GRAVEL PLANT: Extra large capacity with low weight. Meets most highway load limits. Has 1036 jaw crusher, 30" x 24" rolls, 4' x 12' - 2½ deck vibrating screen... yet weighs only 55,900 lbs. on the road!



INTERMEDIATE PLANTS: Used with Primary and Secondary Plants to increase flexibility of operation and boost output. Meets highway height, width, and weight limits. Models offer choice of either jaw or roll crusher.



SECONDARY PLANTS: 4 models of Secondary Plants offer choice of 3018, 4022, and 5424 twin roll crushers or 4022 triple roll crusher with 3' x 10', 4' x 10', or 4' x 12' - 3½ deck vibrating screens.

For men who like to underbid their competitors... (and make a nice profit, too)

Pioneer Portable Crushing Plants



BOTTOM DECK FEED PLANTS: Exclusive method of routing material through plant gives twice the effective screening area of conventional plants, also lets operator equalize load between jaw and roll crusher while plant is operating. These and other features, give extra capacity and unusual control of gradation. Four models.



44 AND 45 SERIES: Full deck sand screen rejects fines and small rock bypasses jaw crusher. These and regular Bottom Deck Feed features give extra big capacity. 4 full screen decks and spouting arrangement can produce 4 sizes of material at same time. Electric or mechanical drives.

PIONEER Distributors and PIONEER's own field engineers are experienced in all phases of aggregates production. They will be glad to study your project, analyze your needs, then help you design an efficient installation that will fit your need.

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<input type="checkbox"/> BITUMINOUS PLANTS	<input type="checkbox"/> IMPACT BREAKERS	<input type="checkbox"/> VIBRATING SCREENS
<input type="checkbox"/> BITUMINOUS PAVERS	<input type="checkbox"/> APRON FEEDERS	<input type="checkbox"/> CONVEYORS

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TORQMATIC brings back steam-engine reversing to road rollers



YOUR roller operator doesn't have to be a gearbox magician to reverse without harmful dwell, spin or stall. With a TORQMATIC DRIVE Converter he focuses his attention on lining up the next pass instead of manipulating levers.

With step-gear ratios eliminated, smaller, high-speed engines are practical. The TORQMATIC DRIVE Converter provides the smoothness and high torque needed during reversing.

Take a tip from 55 manufacturers of 122 kinds of different road-building and construction equipment. Get the Allison TORQMATIC story.

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NO. 6 IN A SERIES
ON SPEEDING AMERICA'S
ROAD-BUILDING PROGRAM



Allison
TORQMATIC DRIVES

Sales and Service

Equipment purchasing and servicing takes less time when you know who and where to call. Keep advised of new distributors, sales personnel and other activities.

Distributor Appointments

Renner Mfg. Co.: Three new distributors for Renner shovels and trenchoe dippers have been announced. They are: Chesapeake Supply and Equipment Corp., Hyattsville, Md.; Shaffer Equipment & Supply Co., Richmond, Va.; Allied Equipment Corp., Carnegie, Pa.

Williams Form Engineering Corp.: Symons Clamp & Mfg. Co. and its dealer organization have been appointed nationwide distributor in the light and general construction field for Williams hardware.

Marion Power Shovel Co.: The following five distributors have been appointed: Champion, Inc., Iron Mountain, Mich.; Standard Equipment & Supply Co., North Little Rock, Ark.; Flack Equipment Co., Toledo, Ohio; Hi-Way Machinery Co., Dallas, Tex.; Kyle Equipment Co., Lapuente and San Diego, Calif.

LeTourneau-Westinghouse Co.: Adams Construction Equipment Co. of Orlando, Fla., is now a distributor for all of Florida except 10 northern counties. Adams plans to open a Miami branch.

Buffalo-Springfield Co.: Three new distributor appointments are announced: McDonald Equipment Co., Little Rock, Ark.; Cactus Equipment Co., Houston, Tex.; Marks Tractor & Equipment Co., Cleveland, Ohio.

Clark Equipment Co.: The construction machinery division announces four new distributors: Da-Nite Equipment Co., Rockford, Ill.; G. H. Goddall Equipment, Ltd., Toronto, Ont., Can.; The Island Supply Co., Grand Island, Neb.; Fuchs-Clayton Machinery Co., Omaha, Neb.

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"Super" shoulders revive beach area development



LOOKING NORTH on Route 528 from Ocean City, Maryland.

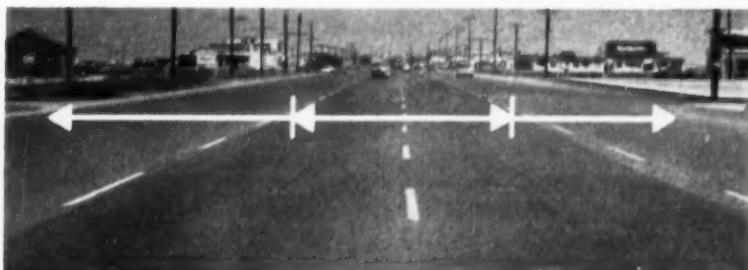
THE STATE OF MARYLAND recently found a relatively simple solution to a paving problem that had for years retarded the development of beach property along a 7.75 mile stretch of Route 528, from Ocean City to the northern boundary of the state. This solution may be of value in other communities and beach areas.

THE PROBLEM: Only a 24 ft. center section of the 100 ft.-wide state-owned right-of-way was paved. 38 ft. on either side of this pavement consisted of loose beach sand. Access to desirable beach properties was restricted. Property owners complained; and, in many cases, built near the pavement on the right-of-way. State funds would not permit full-width paving. Property development lagged.

In 1953, an attempt was made to stabilize the sand with clay, but the stabilized areas could not withstand the erosive action of wind and water.

THE SOLUTION: "Super" shoulders, 38 ft. wide on each side of the pavement. In 1955, these shoulders were reshaped and recompacted; given a Bitumuls Double Surface Treatment. *Cost of this work was within budgetary allowances.* These surfaces have now given more than two full years of service and are still in good condition.

The Bitumuls® Engineers in our office nearest you have on file thousands of similar job reports from all over the nation. *If you have a paving or surfacing problem of any type, Our Engineers will welcome an opportunity to discuss it with you.*



CENTER ARROW Indicates asphalt-paved area (24' width); outer arrows show extent of shoulders (38' on each side of pavement).



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Mobile, Ala.
Inglewood, Calif.

St. Louis 17, Mo.
San Juan 23, P.R.
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Replaces unsanitary bucket and dipper. Portable. Push button faucet. Takes cold, clean water to workers right on the job. 5 gal. steel tank is curved to fit the back. Murky construction. Highly popular.

SMITH GARDEN KING
Low-priced power Sprayer

12 gallon capacity
For spraying silicon water repellents for masonry and cement work and many other spraying purposes. Briggs and Stratton Motor. Very high quality.

D. B. SMITH & CO.

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450 Main St., Utica 2, New York

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NEW Hi Carbon Alloy Steel Stake

Bracing
Footings
Curbs
Gutters

12, 18, 24, 30, 36
and 42 inch lengths.



Stake can be placed flat against lumber for secure nailing.

Symons

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We will be glad to send contractors a sample 12" stake if request is received on company letterhead. Please include 50c to cover cost of postage and handling. OFFER LIMITED!

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SALES AND SERVICE... continued

On the Sales Front

Caterpillar Tractor Co.: John E. Pilon is now district representative in the San Francisco office. He was formerly special representative in Washington, D. C. New earthmoving representatives are H. J. Benzel, Billings, Mont., E. E. Grob, Richmond, Va., and J. M. Johnson, Santa Ana, Calif.

Gorman-Rupp Co.: Donald L. Sanders is now east coast district representative in the area from metropolitan New York through eastern Virginia. He will work out of Morrisville, Penna. Robert E. Ehalt is district representative for Ohio, West Virginia, Virginia, Pennsylvania, New York, and parts of Kentucky. He works out of Mansfield, Ohio.

Eimco Corp.: Two new sales and service specialists are announced: Russell A. Lien, who will work out of the Duluth, Mich., branch; and Denny F. Warnock who will work out of Palatine, Ill.

Master Vibrator Co.: Charles Raper, formerly in charge of branch sales, is now sales manager of the company. Charles Roudane has been named assistant to the sales manager.

Stewart-Warner Corp.: Cyrus P. Olsen has joined the Alemite Industrial Sales Division as field specialist in industrial paint application systems. He will work with distributors throughout the country on sales of Versatal paint pumps.

Clayton Mfg. Co.: W. D. Loudon, formerly Cleveland branch manager, is now central U. S. regional manager for the Clayton-Kerrick Steam Cleaner and Dynamometer Divisions.

In the Main Office

Cummins Engine Co.: Charles E. Martin has been appointed general service manager and member of the executive committee. He succeeds H. E. Bollwinkel, who resigned.

International Harvester Co.: Brooks McCormick has been named an executive vice president to succeed Christain E. Jarcho, who is retiring after 43

McGRAW-HILL BOOK NEWS

Building, U.S.A.

JUST OUT! In this book the editors of *Architectural Forum* give you a close and revealing look at the men and methods responsible for building in the United States: the real estate operator, the tender, the contractor, the labor force, the manufacturer, the architect, and the engineer. An expert's view of our gigantic building process, how it works, and what its future may be in terms of a fine architecture and a beautiful America. 147 pp., 41 illus., \$3.95



Handbook of Rigging

JUST OUT! Condensed into this one book are all the tips, methods, and techniques essential to more effective rigging practices in industrial and construction operations. Deals with everyday maintenance operations—with the transportation and handling of heavy machinery—with the erection and demolition of smaller size structures. Covers everything from ropes, hoisting chains, and hooks, to slings and ladders. By W. E. Rossmagel. *Safety Eng'r.* 2nd Edition. 342 pp., over 300 illus., \$6.50

Estimating Construction Costs

Here are the practical considerations you need to know to make accurate estimates on engineering projects—the understandable methods and helpful data you need for realistic, sound estimating. Each major type of construction is covered in detail not only on materials, labor, and equipment, but on overhead and profit as well. Over 100 time-saving tables help you make speedy, accurate estimates. By R. L. Peurifoy, Prof. of Civil Engineering, A&M College of Texas. 350 pp., 60 illus., \$8.00

PROFESSIONAL ENGINEER'S EXAMINATION QUESTIONS AND ANSWERS

Over 500 questions and complete answers to help engineers pass state license examinations. Covers mechanical, electrical, civil, and chemical engineering, and includes engineering economics and land surveying. Latest questions—suitable for all states. Author has worked on New Jersey examination preparation for 19 years. By William S. LaLonde, Jr., 462 pp., 234 illus., \$6.50.

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- LaLonde—*Prof. Engrs. Exam. Q. & A.*, \$6.50

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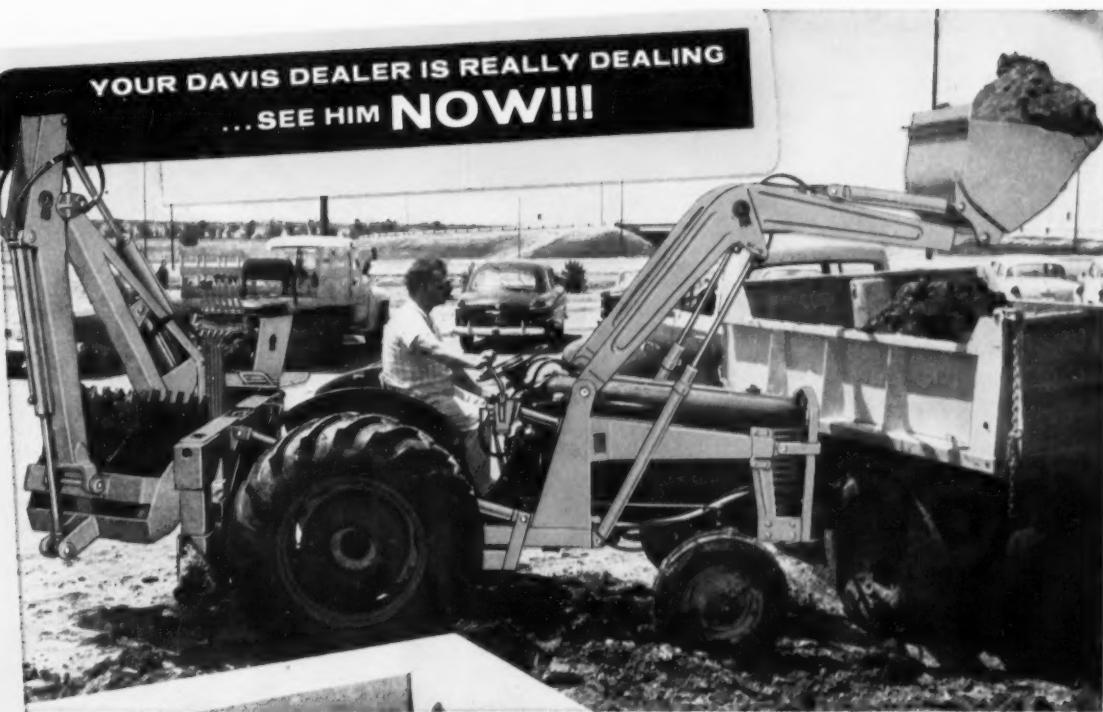
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Only the Davis 210 Backhoe can dig flush alongside of a building like this. It has three interchangeable digging positions — from either end or from the center of the frame. It utilizes an exclusive rotary hydraulic boom swing cylinder that provides 200° continuous operating arc.

When you compare all the features of the Davis Loader-Backhoe with all the others, you would just naturally think it would cost more.

The truth is, it actually costs less than most other makes. And now is the time to see your Davis Dealer for a deal!

The Davis Loader-Backhoe **does** have more to offer that will save you time and make you more money. Visibility is just one. The loader has strength built in so no braces mar your vision. You sit high on the backhoe so you can see exactly where you're digging and the seat moves with the boom to let you always face your work.

Consider utility, maneuverability, strength, quick detachability, quality construction and power (with 7,000 to 10,000 pounds of breakaway on the backhoes) you will come up with the same answer that thousands of backhoe and loader users have, "Davis is the best buy, bar none." Better get in to see that Davis Dealer today!

Davis Loaders and Backhoes are available for all popular models of International, Ford, Fordson Major, Ferguson, Case, Massey-Harris, Allis-Chalmers, Oliver, John Deere, and Minneapolis-Moline Tractors.

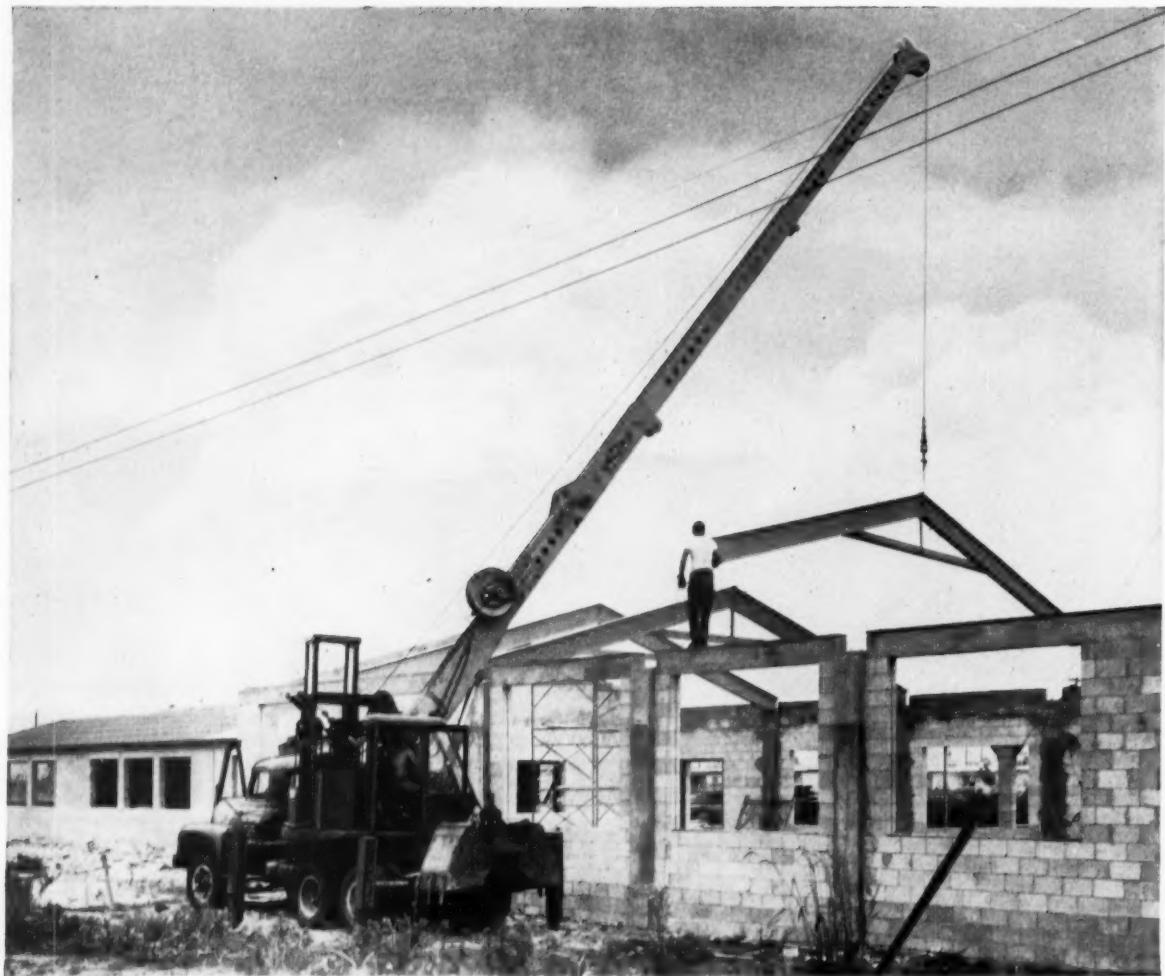
SOLD AND SERVICED EVERYWHERE BY BETTER DEALERS



For the name of your nearest dealers call Western Union by number and ask for Operator 25... or write direct. Please specify make of tractor.

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Basic Hydrocrane Design Builds Profits From MANY Angles

The basic advantages you get from the all-hydraulic Hydrocrane design eliminates hundreds of parts necessary in ordinary cranes . . . gives you a compact, lightweight machine that costs less to operate and maintain.

The Hydrocrane offers big capacity and unusual stability along with compactness, because strain and stresses of the working crane and its loads are supported by outriggers. These four steel legs extend, set and level the machine hydraulically.

With outriggers to carry the load, the Hydrocrane mounts on a conventional truck giving you the advantages of mobility, convenient corner-station servicing and standard-truck repair parts. In addition, you can save right at the start by buying a suitable, inexpensive

used truck on which to mount your Hydrocrane.

Unmatched precision control lets you handle loads precisely; telescoping boom reaches out for extra jobs; working boom hoist changes boom angles while swinging . . . at the flick of a lever; and a selection of hydraulically operated attachments are money-making improvements over rope-reeved clamshells, grapples, hoes.

The Hydrocrane's basic design gives you a multi-job speedster that handles jobs ordinary cranes can't touch. Start earning extra returns on your truck-crane investment now. Get the complete profit story on the 5-ton H-3 or the 10-ton H-5 from your Bucyrus-Erie Hydrocrane distributor.

208H57

BUCYRUS-ERIE COMPANY

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**BUCYRUS
ERIE
HYDROCRANE**

SALES AND SERVICE...

continued

years of service. McCormick, who joined the company in 1940 after his graduation from Yale, has held positions in both sales and production departments.

Associations

Wire Reinforcement Institute: Wayne O. Stoughton has been elected president for the coming year. He is manager of sales for Pittsburgh Steel Products of the Pittsburgh Steel Co. Elected vice-president of the Institute was Earl C. Planett, president of Planett Mfg. Co. of Downey, Calif.

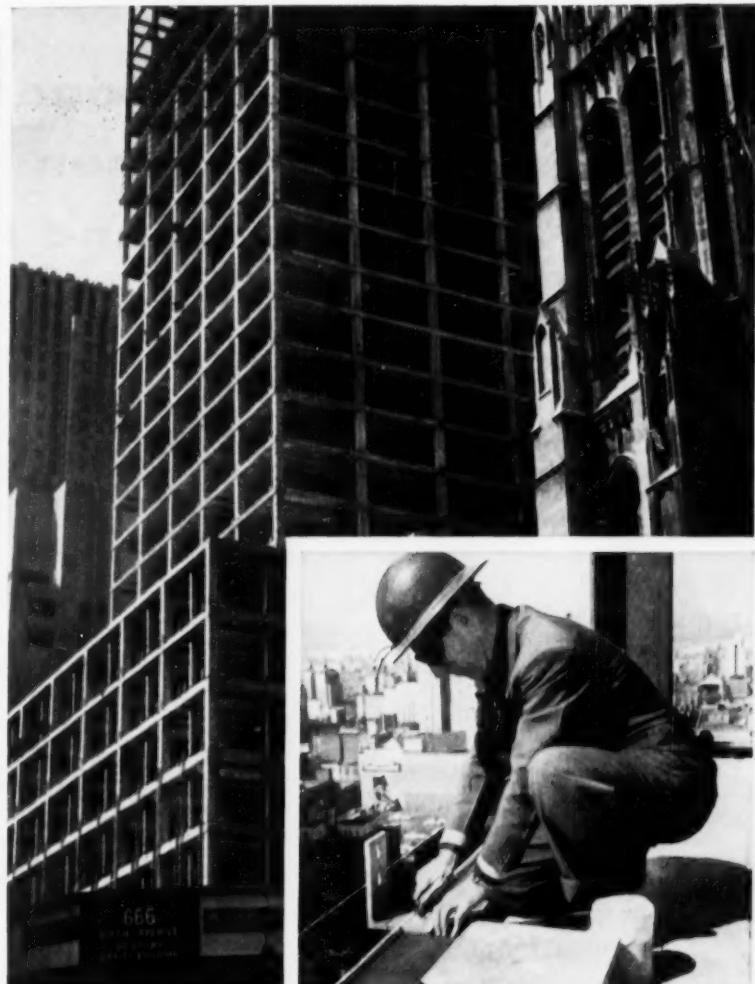
Portland Cement Association: Robertson Sillars is now manager of the publications bureau. Sillars holds the degree of Doctor of Education and has had considerable experience in the fields of adult education and editing of publications. He joined the Association last April.

Clay Pipe Association: Charles E. Perry has joined the Association staff as manager of the government relations department and assistant to the vice president. Perry is a member of the American Society of Sanitary Engineering and chairman of the program committee of the Washington chapter.

Special Mention

Massey-Harris-Ferguson, Inc.: To complete its line of light wheel tractors and equipment, the Industrial Division of M-H-F has bought the assets, patents, and designs of Mid-Western Industries, Inc., of Wichita, Kans. Mid-Western manufactures loaders, back-hoes, cranes, dozer blades, and fork-lifts, among other products, and its sales this year have been averaging \$1 million monthly. All Mid-Western personnel and the trade name "Davis" will be retained.

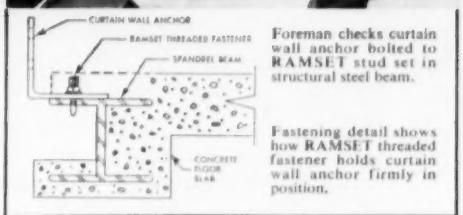
Harnischfeger Corp.: The company's Canadian subsidiary has taken over part ownership of Maritime Steel & Foundries, Ltd., of New Glasgow, N. S., to increase its production facilities. The move will permit Canadian production of P&H power cranes and shovels.



Tishman Building,
666 Fifth Avenue, New York.
Carson and Lundin, Architects;
F. H. Sparks, erector.



Foreman checks curtain wall anchor bolted to RAMSET stud set in structural steel beam.



Fastening detail shows how RAMSET threaded fastener holds curtain wall anchor firmly in position.

Ramset®

helps skeleton don skin . . .
in a hurry!

This skeleton was ready for its curtain wall exterior ahead of schedule. The steel flanges to which curtain walls are attached, were fastened to the beams with RAMSET powder-actuated fasteners . . . *15 times faster* than old-style methods, because RAMSET eliminates pre-drilling! Says the erector, "RAMSET is the most satisfactory and economical method of setting curtain wall brackets for collateral steel work."

For complete details about RAMSET for your uses, ask for new catalog and AIA file, now ready.



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powder-actuated
fastening tool

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OLIN MATHIESON CHEMICAL CORPORATION

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CLEVELAND 11, OHIO

**"we looked at our roads...we looked
at our budget...then we looked
for a solution...and found it in the**

...Pat Thomson, Douglas County (Wash.) Engineer



Truck dumping aggregate in Moto-Paver hopper. This "dump and run" operation requires fewer trucks on a job, since they are not held up in dumping. A minimum of crew is needed for the entire operation. Moto-Paver handles any size and type of aggregate with equal efficiency.

or—how a county engineer saved his county \$2 per ton on asphalt

Pat Thomson, like many other county engineers in the northwest, had some tough road problems to solve. He had inherited many miles of dilapidated road-mixed and concrete roads and streets. New dam construction jobs and new industries had jumped traffic on some roads and streets from 100 vehicles or less per day to as high as 7,000 vehicles daily. These streets were in dire need of widening—and resurfacing.

"But," says Pat, "Douglas County is not exactly rolling in filthy lucre. In fact, we are so tight fisted up here that we count our dollars by the penny, and know where each one of them goes. So—we watched our costs closely. We finally found our solution in the form of cold mix asphalt, with a Hetherington & Berner Moto-Paver. A Moto-Paver owner from Wenatchee studied our job and

gave us a price of \$6.20 per ton (approximately 52c per sq. yd. of cold mix in place under all conditions for a 1½ inch compacted mat.) This compared to a cost of \$8.20 per ton of hot mix."

Earl Barnwell, another county engineer from Washington (Snohomish County), according to Pat Thomson, has one of the most terrific weather problems in the U.S. In some cases he has had to "dry out" road mixed windrows as many as six times. Using the Moto-Paver, the only wet aggregate, in event of rain, is that which would be enroute to the job. With the Moto-Paver, Snohomish County's average cost per mile for a 2" mat 20 ft. wide was \$3,555.70, with an extreme low of \$2,840 and a high of \$4,020. As a result of their experience with this first Moto-Paver, Snohomish County expects to buy two



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H & B Moto-Paver™



Asphalt is brought to the job in tank trucks for quick loading of the machine. All of the Moto-Paver operation tends toward a minimum loss of working time.



more such machines. Mr. Barnwell feels that while the Moto-Paver in no way supplants a hot mix plant, it does an excellent job of replacing

old style roadmixing operations. The load in the machine is mixed and laid in approximately 2½ minutes, consequently there is no dangerous windrow of unmixed material left on the road. Traffic control is localized, cheap, and easily maintained. The extreme mobility that allows taking advantage of even one day of sunshine makes the machine especially useful for all rainbelt territories.

The above are just two of scores of examples that could be given to show how the Moto-Paver speeds the job and cuts the cost in resurfacing and maintenance work of all kinds. In the 12 years it has been on the market, Moto-Paver has established equally enviable records for efficient, economical production in many parts of the world under widely differing job and terrain conditions. In the mountains of Switzerland and Italy, the deserts of northern Africa, the tropical jungles of Central America, as well as in all sections of the U. S. and in Canada, Moto-Paver has met the requirements of all types of work under all kinds of conditions, using many different types of aggregate.

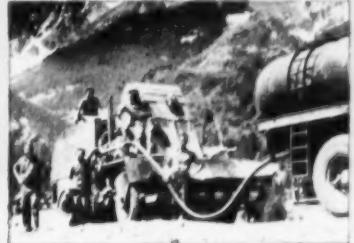
Bulletin MP-55, which gives complete information and specifications on the Moto-Paver, will be sent on request.



Moto-Paver
on Texas sub-division job



Moto-Paver
on Michigan road job



Moto-Paver
on Alps Mountain job, Switzerland



Moto-Paver
on Central America job



Moto-Paver
on Rome (Italy) Airport job



Moto-Paver
building road in France

Construction Equipment News...



Allis-Chalmers Shows Its Newest Scraper

Latest addition to the Allis-Chalmers motor scraper line is a 7-9½-yd model powered by a supercharged, six-cylinder, 155-hp A-C diesel. Designed to maneuver easily in close quarters, the TS-160 features two-speed, 90-deg hydraulic steering that enables the rig to turn in 24¾-ft; a constant-mesh transmission with five speeds up to 25.4 mph; and hydraulic scraper controls. A curved, one-piece bowl facilitates loading. Apron opening is 85½ in. and the blow sides are 41 in. high. Maximum width of cut is 97½ in., maximum depth of cut is 24¾ in., and maximum depth of spread is 16½ in.—**Allis-Chalmers Mfg. Co., Milwaukee, Wis.**



Vibratory Roller

Browning's tow-type vibratory roller has a drum 40 in. in dia and 60 in. long. The entire unit weighs 3,500 lb. The vibrator is driven through V-belts by a four-cylinder air-cooled Wisconsin engine. The force of vibration is easily altered, and by pre-setting the throttle control on the engine governor the frequency is variable from 1,000 and 2,200 vibrations per min. Called the model V-60, the low-cost roller has been tested for the past year.—**Browning Mfg. Co., 111 Humble Ave., San Antonio 6, Tex.**



Payload is 40,000 Lb +

Diamond T rates its latest dump truck model at 40,000 lb payload, but with its 50,000-lb capacity Timken tandem rear axle and 14,000-lb Shuler front axle, this rating provides a wide safety margin. Tire size is 12.00-24. The truck, pictured with a rugged 12½-ton dump body, is powered by a Cummins NHB-600 diesel that develops 210 hp. Other Cummins diesels, including turbo-supercharged units with ratings up to 262 hp, are available with a considerable variety of transmission options.—**Diamond T Motor Car Co., 4401 W. 26th St., Chicago, Ill.**

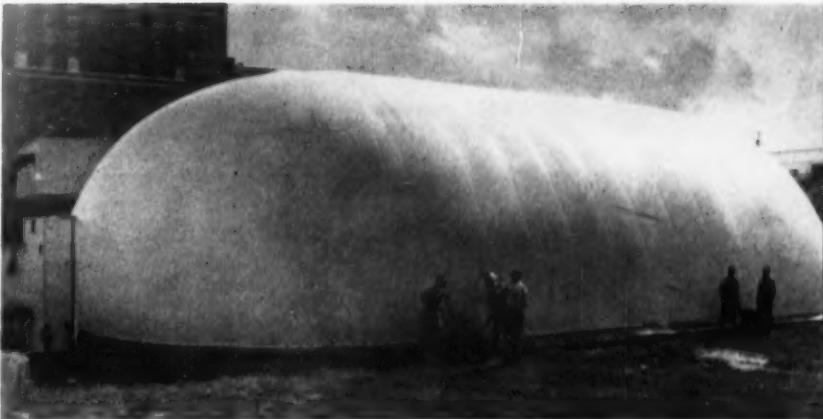
Vibrating Units Change To Meet Job Needs

Jackson's new pan-type vibratory compactor has six independent compaction units that can be detached or regrouped to fit job requirements. The new machine bears a resemblance to the popular original Jackson compactor, but the new machine delivers 4,200 3-ton blows per min—an increase of approximately 2,000 lb per blow over the previous model. A single engine now operates both the generators and transmission. The two generators that supply current to the compactors produce single and three-phase 110-130-v, 60-cycle ac current. The machine also can serve as a mobile power plant.—**Jackson Vibrators, Inc., Ludington, Mich.**



Air Keeps It Taut

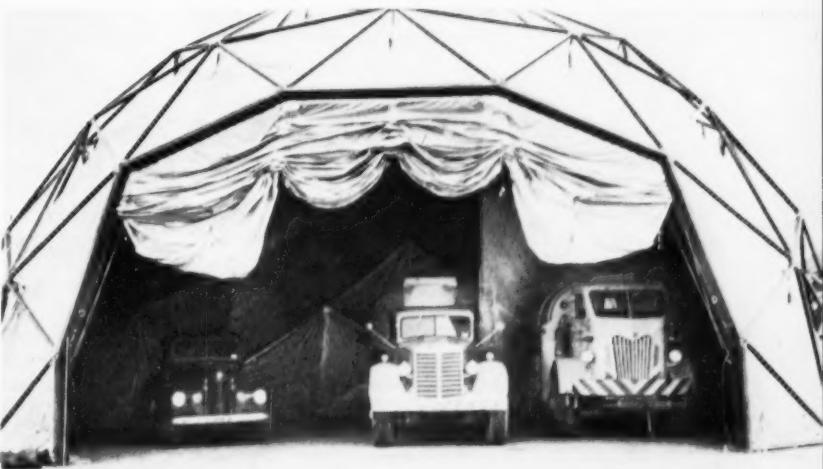
The CID Air Structure is inflated at the site and kept taut by low pressure air supplied by a blower. The model pictured was erected in 2½ hr for a pipe line contractor as a storage hut. It is made of vinyl coated nylon, a translucent fabric that admits light. An air lock permits flatbed trucks to enter. The structures are 20 ft high and they enclose floor areas ranging from 40x80 to 60x120 ft. They cost approximately \$1.00 per sq yd.—**CID Air Structures Co., 1501 E. 96th St., Chicago 28, Ill.**

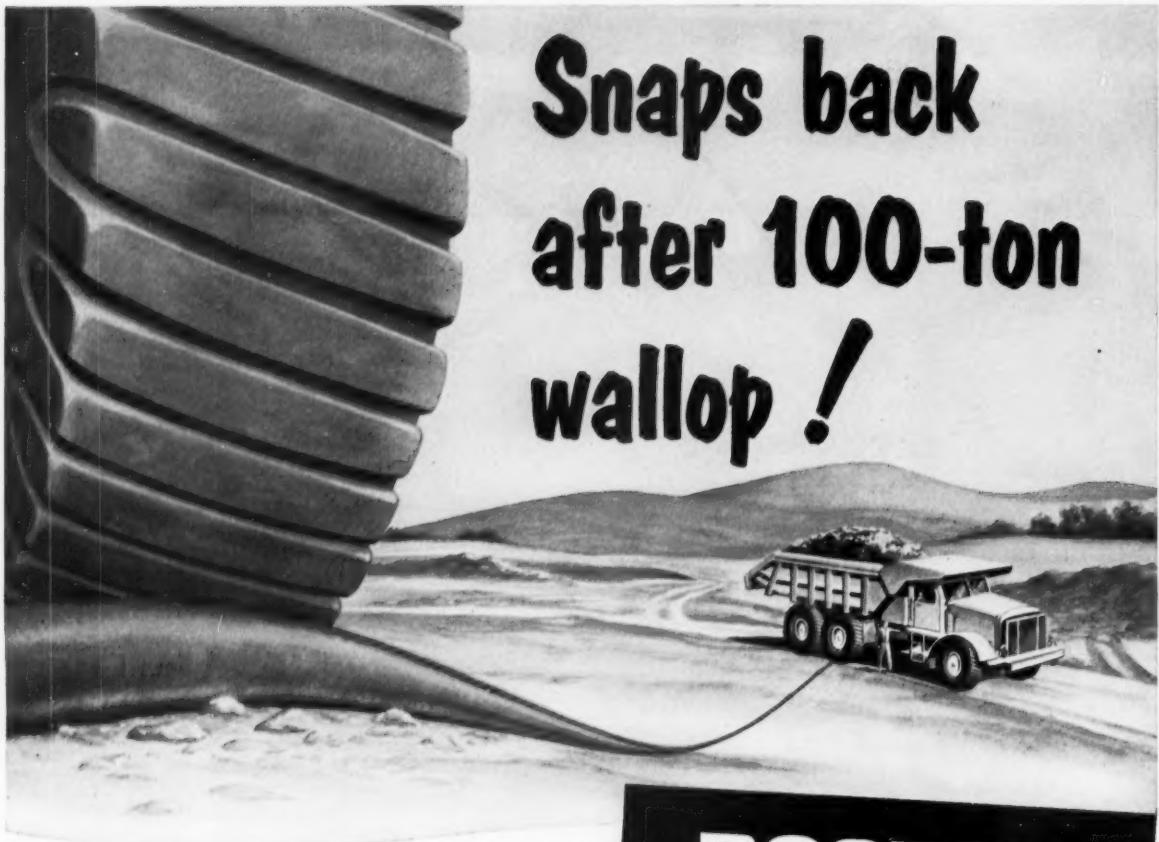


Inexpensive Shelter

Geodesic shelters, consisting of an aluminum frame that supports a thin canvas skin, are now available as quickly erected, all-weather structures for equipment or materials storage or temporary maintenance operations. It took only 40 man-hours to erect the 42½-ft dia shelter pictured. Other sizes range from 20 to 114 ft in dia. The absence of internal structural members permits full use of the available floor space and the wide entrance accommodates big trucks. The shelters can be stored and re-used.—**Magnesium Products, Milwaukee, Wis.**

continued on page 225





Snaps back after 100-ton wallop!

This is the hose built to take the most brutal treatment. So strong it snaps back even after being battered by a loaded Model LLD Euclid — a gross weight of 203,300 pounds!

When you consider that 45% of air hose failure is caused by *external* conditions, Boston Concord Yellow Jack is definitely the air hose to choose for your toughest jobs. It has the stamina to handle repeated rugged impact . . . the strength to withstand the highest internal pressures.

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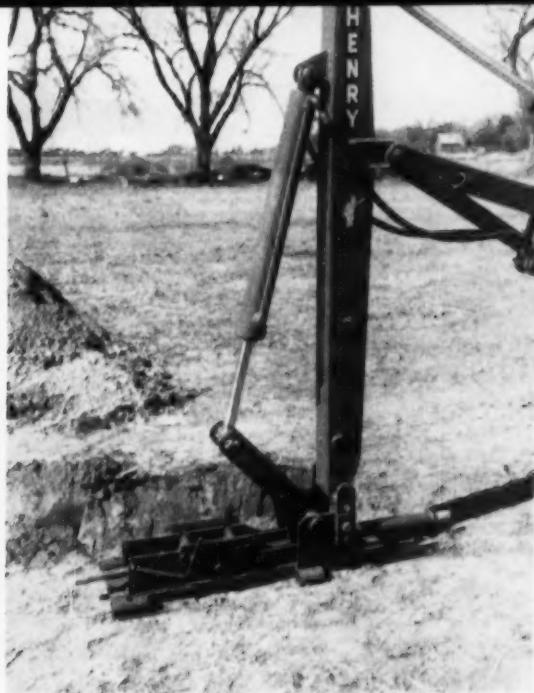


TAPE



New Electrodes Ease Hardfacing Jobs

Two new 3/32-in. tubular wire electrodes for open arc, semi-automatic hardfacing and repair jobs have been developed by Amsco. When used with an Amsco MF welder, wire is motor-fed through a 14-ft flexible shaft. Trouble-free feeding is assured because of the uniformly circular shape of the pre-lubricated wires. The electrodes are S/A manganese wire coil for build-up and repair jobs; and S/A 53 for impact and wear resistance.—**Amsco Div., American Brake Shoe Co., 230 Park Ave., New York, N. Y.**



Pipe Pusher Attaches to Backhoe Frame

The Ram-A-Rod is an attachment for the Henry hydraulic backhoe that pulls or pushes 3/4 to 3-in. pipe or service lines under roads or sidewalks. The pusher, which replaces the bucket on the backhoe frame, has a 6-in. driving stroke and it exerts 30 lb of pressure. With the new attachment one man can dig trenches, replace the bucket when obstructions are encountered, and drive pipe. It takes only minutes to attach or release the tool.—**Henry Mfg. Co., Inc., 1700 N. Clay St., Topeka, Kan.**



Takes Weight Off Drive Wheels...

A new dolly for the LeTourneau-Westinghouse model C Tournapull quickly attaches under the nose of the big prime mover to bring its weight within legal axle limits for over-the-road travel between jobs. When the rig arrives at its new job, the dolly is easily transformed into a two-ton mobile utility crane that can be hitched behind a pick-up truck. With a simple three-point hook-up, the dolly is positioned under the prime mover in 10 min without special tools. The amount of weight transferred from



...Then it Becomes a Crane

the prime mover drive wheels to the dolly wheels is easily adjusted by inserting shims behind the big knee-action compression springs on the dolly. The tires, mounted on caster wheels, are 7.50-10. After the dolly is removed from the 'Pull, two bolts lock the casters in parallel tracking position. When support, boom, and jib assemblies are bolted to the frame, the dolly becomes a handy crane. Price is \$1,730.—**Reisser Corp., Box 362, Blair, Neb.**

continued on page 227

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*a Complete Line
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SPIROLOC Form Ties



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nut washer

SPIROLOC Cone Nut Assembly



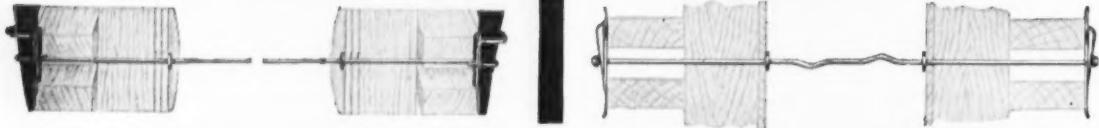
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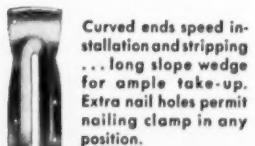
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Combination wedge
and bearing plate . . .
easy application . . .
won't twist or fall off
—ample take-up.

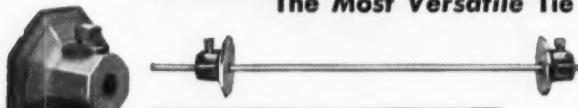
- Low cost ties for job-built or prefabricated forms
- Used with or without walers
- Accurate breakback . . . minimum plug required
- Choice of Spreader Washer . . . 7/8" flat is standard
- Rugged Twistye and Snap Tie Clamps have extra bearing surface . . . additional safety factor



Curved ends speed installation and stripping . . . long slope wedge for ample take-up. Extra nail holes permit nailing clamp in any position.

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SAFE . . . SURE Tying

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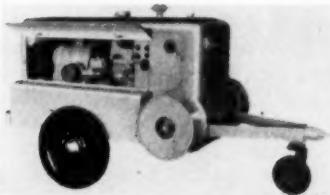
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WEATHERPROOF POWER — A weatherproof steel housing is a distinctive feature of a new 24-hp engine developed by Kohler Co. The new engine is a four-cycle, air-cooled unit. It has two opposed cylinders and develops its 24 hp at 3200 rpm. The blower and housing are designed so that baffles direct a large volume of cooling air around the finned cylinder and head area. The engine is equipped with a rainproof, silencer-type muffler. Called model K660G, it comes with a 5½-gal fuel tank. Total weight is 280 lb.—Kohler Co., Kohler, Wis.



MULTI - STAGE ROTARY — Davey's new 125-cfm Hydrovane rotary compressor is a multi-stage unit with a single free-floating rotor. The rotor, positioned so that it is constantly concentric with only one side of the stator, has segmented blades that move in a straight line from the stator center so that they cannot cock or bind. While the rotor turns and compression continues, oil is injected through two multi-stage cooling oil injector chambers. According to the manufacturer, this produces a continuous cooling action that lowers air discharge temperatures rapidly and effectively. The multi-stage feature also reduces the engine horsepower required, so that the compressor delivers more air for less fuel. The new compressor is said to have



Kaiser engineer sights through Berger 18" Dumpy Level under blistering desert sun on the site of Permanente's plant, designed to turn out 2,400,000 barrels of cement yearly.

Kaiser Engineers tell how

BERGER INSTRUMENTS beat desert sand and heat

Brutal climatic conditions were the order of the day, *every day*, during the construction of the huge Permanente Cement Company plant at Lucerne Valley, California. Yet, the job called for close tolerance measuring in layout of buildings and placement of machinery.

Berger levels were continually exposed to this blistering desert heat and clouds of destructive dust—conditions that would challenge the accuracy of ordinary instruments. But not Berger Instruments. Kaiser engineers put it succinctly: "They stayed in adjustment and performed perfectly, *without maintenance*, in these difficult situations."

Layouts for mill building, primary crusher, burner building and clinker cooler foundations were all done with Berger Instruments. Rough grade tolerances were held to .01 ft., base plates and equipment foundations to .007 ft. Two 12 ft. by 450 ft. rotary kilns, among the world's largest pieces of moving machinery, were installed with the aid of Berger Instruments.

Heat, sand, dust—not every job calls for such punishment. But isn't it good to know you have this extra safety factor, just in case?

That's why, where accuracy is at stake . . . any time . . . in any climate, leading engineers and construction men buy Berger. Put yourself behind a Berger—and see why.

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**Hobbs ENGINE HOUR METERS
TAKE AWAY THE GUESSWORK**

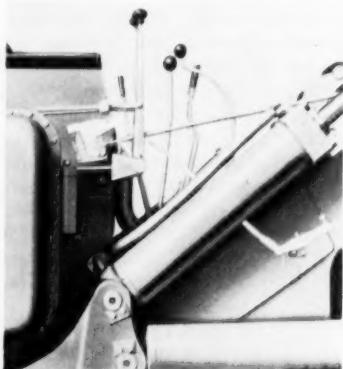
Beat down-time through timely maintenance . . . know WHEN lubrication, oil change, overhaul, etc., are due. Today's engineers recommend maintenance in terms of operating time instead of distance . . . the Hobbs Engine Hour Meter provides that information. Not a revolution counter, but a true electric timing instrument recording HOURS and MINUTES. Ruggedly built . . . simple to install . . . easy to read. For both gasoline and diesel engines. Approved and recommended by leading manufacturers. See your factory branch, representative, distributor . . . or WRITE:



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EQUIPMENT NEWS . . . continued

less than one-half the working parts of most other compressor designs. Volumetric efficiencies of up to 93% are claimed for the unit. Other features include primary and secondary intake air cleaners; a three-stage oil separator; and single adjustment, vacuum-hydraulic supply controls. Sight windows are provided for visual inspection of lube oil and oil separation processes, and a removable end panel and side panels facilitate servicing. The 125 rotary is available with two-wheel trailer or skid mountings. On a two-wheel trailer the unit is 10 ft 2 in. long, 5 ft 5 in. wide, and 5 ft 1 in. high. It weighs 2,600 lb.—Davey Compressor Co., Kent, Ohio.



TRAXCAVATOR AID—Automatic bucket positioners for the No. 955 and No. 933 Traxcavators have been developed by Caterpillar. The bucket positioning feature, long a standard for the Cat No. 977 Traxcavator, automatically moves the bucket tilt control lever from the tilt-back position to the hold position when the bucket reaches a preset digging angle. The adjustable linkage provided with the positioner allows the bucket to be positioned at any point between a 5-deg digging angle and a 3-deg tilt-back angle. For No. 955 and No. 933 units already in operation, field change-over kits are available.—Caterpillar Tractor Co., Peoria, Ill.

STEAM CLEANER LINE—Three new steam cleaner models have been introduced by Kelite Corp. These are the Mark I, with an output rating of 120 gph; the Mark II, with a 200 gph rating; and the Mark III, with a 300-gph

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WORKING IN THE "CREEK OF THE BEAUTIFUL GARDENS" in Los Angeles, is this American 50-ton capacity 700 Series Truck Crane. It's placing heavy, reinforced concrete pipe sections in a trench that ranges down to 33

feet in depth. Average lift on this job is 21 tons! To work in the restricted area under trees and utility lines, this American Crane is equipped with a special "short" base boom section.

50-TON CRANE SPOTS 108" PIPE FOR LOS ANGELES STORM DRAIN

The Arroyo De Los Jardines Storm Drain is an \$800,000 project in the Wilshire District of Los Angeles. Pipe diameter of this 7,900-foot long drain ranges from 78 to 108-inches. An estimated 10 months will be required to complete the project that cuts through the middle of the city.

George W. Peterson, North Hollywood general contractor, is using his big American 700 Series Truck Crane on the project. The American, following behind a ditcher, cleans up the trench with a 1½-yard clamshell bucket. Then operator Kenny Reisenstall swings the American around to pick up and place the reinforced concrete pipe sections that weigh from 18 to 25 tons apiece. Up to 240 feet of ditch and pipe laying have been completed in an 8-hour day.

Owners, like George Peterson, find that American's efficiency and speed really pay off on large-scale projects. Responsive air controls powering smooth acting clutches and brakes give the operator precise load control under every job condition. Unusual operating efficiency results from careful design that eliminates all unnecessary, non-productive deadweight!

Your American Distributor is *on call*—ready to give you the complete technical story on the crane that sets the pace on construction jobs everywhere. He has facts on the entire line of American crawler and truck cranes in capacities from $\frac{1}{2}$ -yard, $12\frac{1}{2}$ tons up. American has the machine, the front, the capacity that will do your job fastest, most efficiently and most profitably!

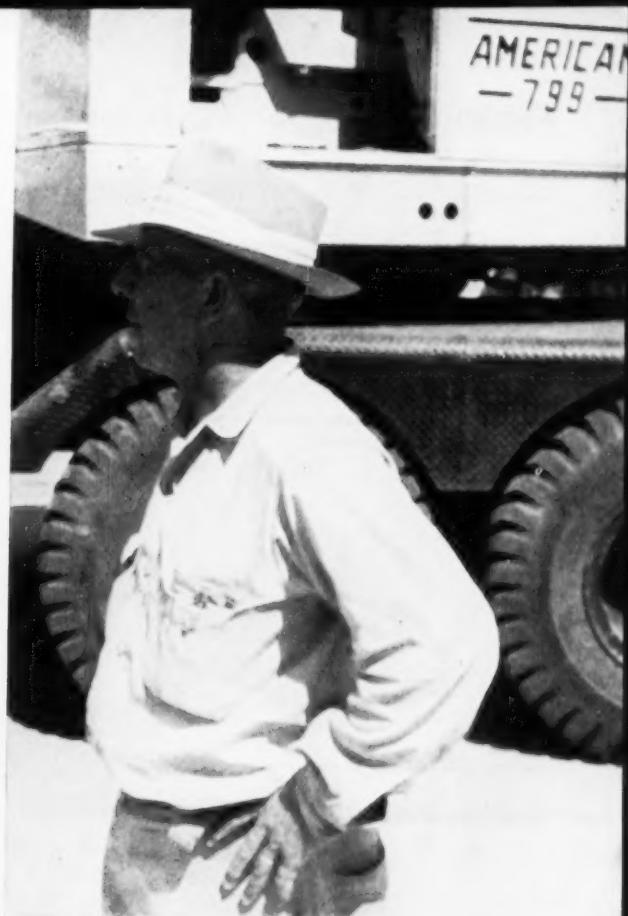
(Advertisement)

"FAST AND EFFICIENT" is contractor George Peterson's comment about his American 700 Series Truck Crane. "I like my 50-ton American because it does its work in a hurry—that's why I bought it!" Profit conscious contractors choose the big 700 Series because it gives them thousands of hours of trouble-free operation at remarkably low hourly cost! Check with American owners and operators—they'll give you the straight facts about on-the-job performance that you should know before ordering any crane!



REACHING UP AND OUT 130 FEET to set steel is American's popular 300 Series Truck Crane. On this job the operator, Roscoe Coleman, reported . . . "good stability considering boom length and radius." He added, "I haven't operated many cranes that will lift 130 feet of boom right from the ground, but this American does it any day!" For every job from excavating to steel setting, you'll find the 300 Series on crawlers or rubber—in 25 or 30 ton models—a profitable investment.

FAMILIAR SIGHTS ON THE BIGGEST PROJECTS, American Revolver Cranes have earned international recognition for performance. Designing and building these mammoth machines, with capacities to 400 tons, has given American engineers unequalled experience. This knowledge has been invaluable in the design and manufacture of American's crawler and truck crane line—a line that gives every American owner big crane performance and durability plus amazing efficiency and low cost operation!



"FULL BUCKETS ON EVERY PASS" are reported by owners of American Backhoes. The ingenious linkage design changes the bucket pitch to fit your job conditions. The result is full buckets, clean dumping and minimum spillage! This 200 Series Crawler features compact, efficient design that results in low initial and low operating cost. It's rated at $\frac{3}{4}$ -yard, 22½ tons on crawlers or rubber.

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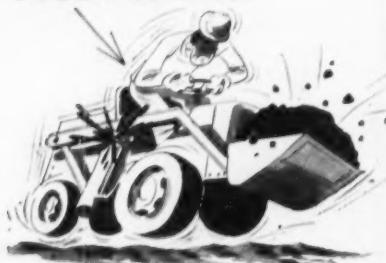
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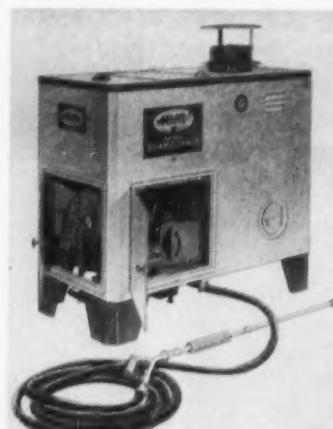
Longer Life for Bucket Loader! Greer Damper eliminates harmful shock that damages cylinders, hoses, packings and causes structural strain. Parts last longer, perform better! Cuts downtime and maintenance. Reduces operating costs.

Up Driver Output! More work per loader! Greer Damper frees driver from tiring effects of heavy shock and vibration. Adds to his comfort, safety, and working efficiency!

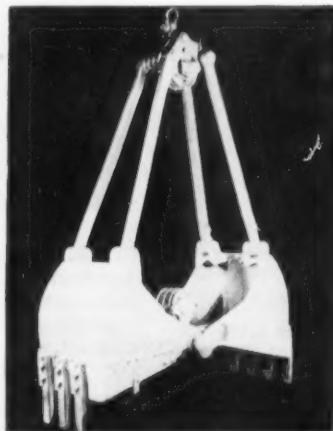
Get Smoother, Faster Operation! Your jobs are done faster than ever before. A Greer Damper s-m-o-o-t-h-s the road for greater on-the-job speed. Means more profit for you.

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EQUIPMENT NEWS...continued



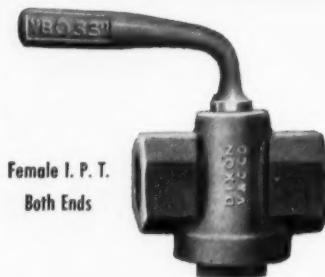
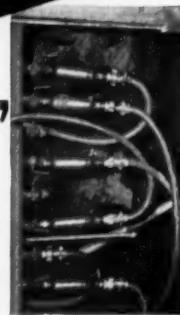
output. All three achieve these ratings at 320-deg F. Each has a positive displacement piston pump that delivers the full rated output at several hundred feet from the machine. Other features include a water-wall heat exchanger that provides maximum fuel economy, and a choice of a gas or an oil burner for instant starting. Standard equipment includes a heavy-duty steam cleaning gun with a swivel-type rear grip and a forward grip that is aerated to provide cool operation; a high velocity spray nozzle; and heavy-duty hose. Optional equipment includes a nozzle control for gas-fired models, a trailer or caster mounting for oil-fired models, and flat nozzles.—**Kelite Corp., 81 Industrial Rd., Berkeley Heights, N.J.**



FAST-RELEASE BUCKETS — Hutton's new Pelican line of clam shell buckets features carefully calculated inside and outside arm lengths that, together with good weight distribution and a new

**Avoid One Cause
of Air Line Leaks
and Pressure Loss**

**"BOSS"
Self-Honing
AIR VALVES**



**Female I. P. T.
Both Ends**

Built to withstand the hard knocks of mining and construction service, "BOSS" Valves are also ideal for general use on pipe lines, hose lines, compressor tanks, etc., and for the handling of water. They do not require packing.

Bronze plug firmly seated by spring tension against harder metal of valve body is automatically honed to perfect seat as handle is turned. A straight, full-flow opening extends through valve body and plug, providing greater capacity with no friction loss. Valve opens or closes by a quarter turn of the handle.



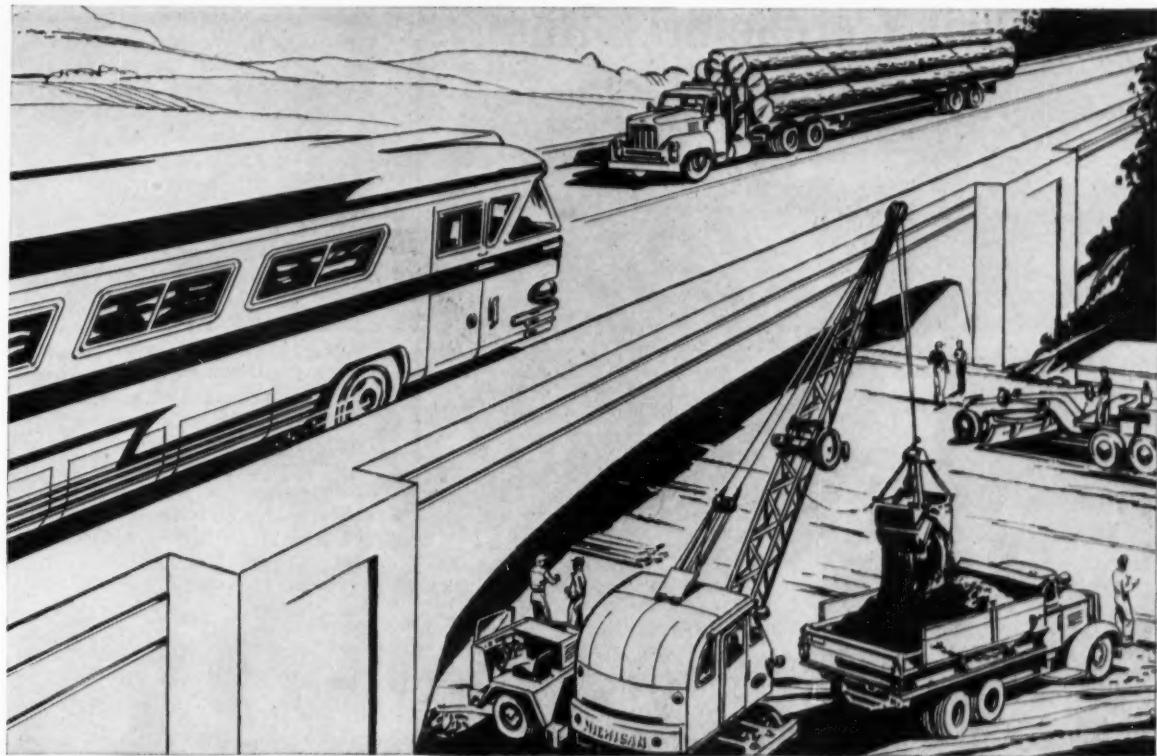
Male I. P. T. Both Ends

**Stocked by Manufacturers and Distributors
of Industrial Rubber Products**

DIXON
Valve & Coupling Co.

GENERAL OFFICES & FACTORY—PHILADELPHIA 22, PA.
BRANCHES—CHICAGO • BIRMINGHAM • LOS ANGELES • HOUSTON
DIXON VALVE & COUPLING CO., LTD., TORONTO Associate Companies
Rock Iron Company, Inc., Bayonne, N.J. • Precision Drawn Steel Company, Carteret, N.J.

Important Announcement by Clark Equipment



... A New CLARK 5-Speed Synchronized Transmission



Here's news vital to operators and builders of heavy-duty equipment—trucks, coaches, crane-shovels, construction machinery.

This latest engineering triumph from power-train headquarters is entirely new in every detail; and is equipped with the Clark Split-Pin Synchronizer—proved dependable by millions of miles of heavy-duty operation

Two basic models—both 5-speed, synchronized in 2nd, 3rd, 4th, 5th

300 V—Nominal torque rating 350 lbs-ft
400 V—Nominal torque rating 450 lbs-ft

For full information mail your inquiry to Clark Equipment Company, Transmission Division, Jackson 6, Michigan.

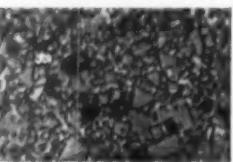
Transmission Division
CLARK EQUIPMENT COMPANY
Falak Road
Jackson 6, Michigan

CLARK
EQUIPMENT

Longer bit life—with new Sandvik Coromant X-Bits



Sandvik Coromant Tungsten Carbide. (Microphoto) Uniformity of size, even distribution of grain are marked. Free from porosity and impurities—therefore stronger, longer-lived.



Low quality Tungsten Carbide. (Microphoto) Black marks are contaminations caused by deficient production control. They weaken the carbide, reduce its working life.



NEXT time you buy bits, specify Sandvik Coromant because they give you more footage per bit, lower drilling costs. Here's why:

- 1 Only first-quality tungsten carbide is used—as shown in the microphotos above. This means less wear, longer life and a better job.
- 2 the bodies are precision-made of high quality alloy steel—tough enough to take the strain throughout the extra-long bit life.
- 3 the bigger Sandvik Coromant bits are all of X-design, which prevents rifling. No wonder Sandvik Coromant inserts are the most widely used in the world, drilling more than one billion feet every year.

THESE STANDARD SIZES ARE AVAILABLE

BOTTOMING TYPE	SHOULDER TYPE	THREAD	DIAMETERS AVAILABLE (IN INCHES)
		7/8 F	1 1/2
		1" H	1 1/2, 1 3/8, 1 3/4 and 1 7/8
		1 1/8 D	2, 2 1/8, 2 1/4, 2 1/2, 2 3/8 and 3
		1 1/4 K	3, 3 1/2, 4 and 4 1/2
		1 1/4 Rope	1 1/8, 2, 2 1/8, 2 1/4, 2 3/8 and 3
		2" Rope	3 1/2, 4, 4 1/2 and 5
		400	2, 2 1/2 and 2 1/4
		600	2 1/2, 3 and 3 1/2

The sizes underlined are X-shaped bits

SANDVIK COROMANT bits are supplied through Atlas Copco, the world's largest manufacturer of rock drills, who also supply Sandvik Coromant integral steels—the most widely used in the world—cross bits from 1 1/2" to 2 1/2" and extension steel equipment.

Write, phone or cable today for further details to any of the addresses below:

Atlas Copco

EASTERN — P.O. Box 2568 Paterson 25, N.J. Phone — Armory 4-3310

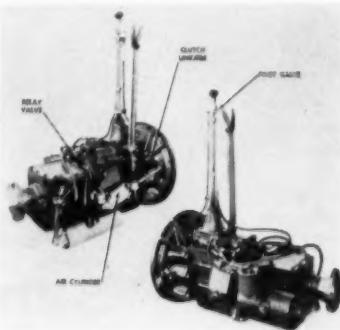
PACIFIC — 930 Brittan Avenue, San Carlos, Calif. Phone — Lytell 1-0375

CANADA — Montreal Airport, Quebec. Phone — Melrose 1-1871

MEXICO — Apartado Postal 56, Torreon, Coahuila. Phone — 39-07

EQUIPMENT NEWS... continued

pulley design, speed opening and closing. The buckets have a block and tackle-type reeving system that keeps the cables and pulleys out of contact with the material being handled. Besides prolonging cable and pulley life, this design allows an equal amount of force to be transmitted to all four arms so that the center of gravity is lowered and the bucket operating cycle is quickened. Cutting teeth and cutting lips are forged of the new T-1 steel, a low-carbon, quenched and tempered alloy plate steel that combines a high yield strength with extreme toughness. Buckets can be furnished with bottom teeth only or with bottom and side teeth. Major components of the line, which covers five models, are interchangeable.—Hutton Fabricating Mfg. Corp., Cleveland, Ohio.



AUTOMATIC DE-CLUTCHING

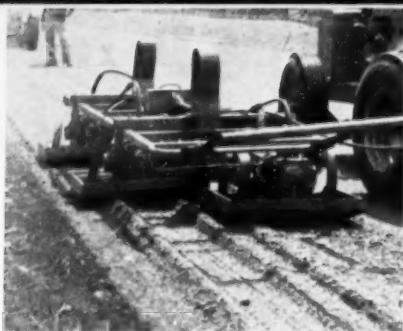
—Fuller Mfg. Co. has developed an air powered de-clutching system for models R-46, R-96, and R-960 RoadRanger transmissions. The new system is used to release or engage the clutch while the vehicle is in forward motion without using the clutch pedal. The clutch is released or re-engaged automatically in the normal course of moving the shift lever to engage the gears. Operating from the vehicle air system at full line pressure, the system employs a pilot valve, relay valve, and air cylinder. As the pilot valve mounted at the top of the gearshift lever is actuated, air flows through it to open the relay valve. As the relay valve is opened air flows to the cylinder, which is linked to the clutch pedal shaft. Movement of the piston releases the clutch. When the pilot valve is closed the cylinder is exhausted and the clutch is re-engaged. The pilot valve has an actuator that is

10 LEADS

TO BETTER, and BIGGER FASTER RESULTS PROFS!



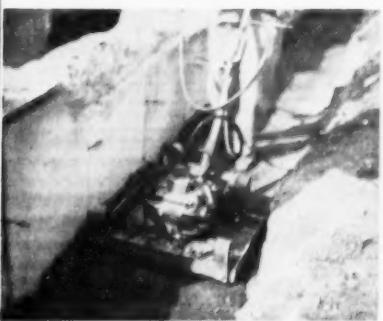
MACADAM DENSIFICATION. The Jackson Multiple Compactor gives you base and sub-base compaction at its quickest and best. Each of the 6 units in workhead delivers 4200 3-TON BLOWS per minute.



PAVEMENT WIDENING. Any arrangement desired of the vibratory units of the Jackson to fit the job most advantageously and provide 100% of required density in ONE PASS is easily and quickly made.



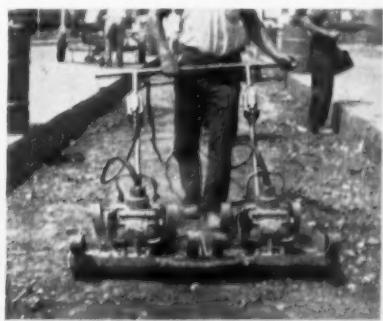
GRANULAR SOIL FILLS. The Multiple Compactor quickly achieves specified density, gets into places bigger, more expensive equipment cannot reach. Individual units can be detached, operated as manually guided compactors.



SOIL COMPACTION. Self-propelling, the Jackson Compactor, with 12" to 26" interchangeable bases, achieves specified density of granular soils in 6" to 8" layers at the rate of 600 sq. yds. per hr. Perfect for bridge and pipe line fills, concrete floor sub-bases and similar applications.



BLACKTOP WIDENING & PATCHING. The same machine operated from power plant on auto-trailer with pickup for Compactor is most efficient means of blacktop pavement patching, paving walks, drives, etc. Will compact up to 600 sq. yds. per hr close to maximum density.

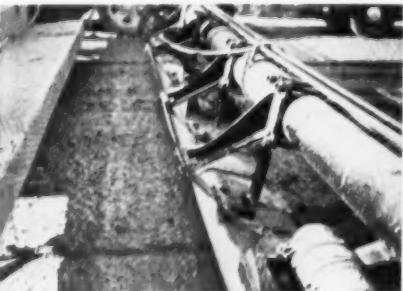


TWIN-UNITS — ONE OPERATOR. With a two-unit, side-by-side or tandem hookup of JACKSON COMPACTORS, one man can readily do the work of two, since the compactors are self-propelling and he has only to guide them.



CONCRETE VIBRATION FOR HIGHWAY AND AIRPORT PAVING

INTERNAL TYPE: super-powered, gives full width internal vibration through full depth of very thick slabs. Saves time, cement; provides greater density and compressive strength.



SURFACE TYPE: does perfect job of vibrating all mixes in depths used on highway projects. The owner of a JACKSON Paving Tube can quickly switch from internal to external vibration, or vice versa, at minimum expense.

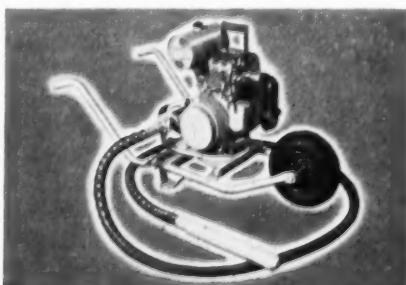


MUNICIPAL PAVING: This vibratory screed strikes off to all crowns, undercuts at curb or sideform, works right up to and around obstructions, is rolled back for second passes on 4 rollers. Most productive and convenient screed made.

**FOR SALE OR RENT
AT
YOUR JACKSON DISTRIBUTOR**

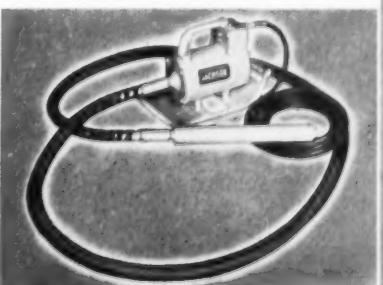
**JACKSON
VIBRATORS, INC.**

LUDINGTON, MICHIGAN



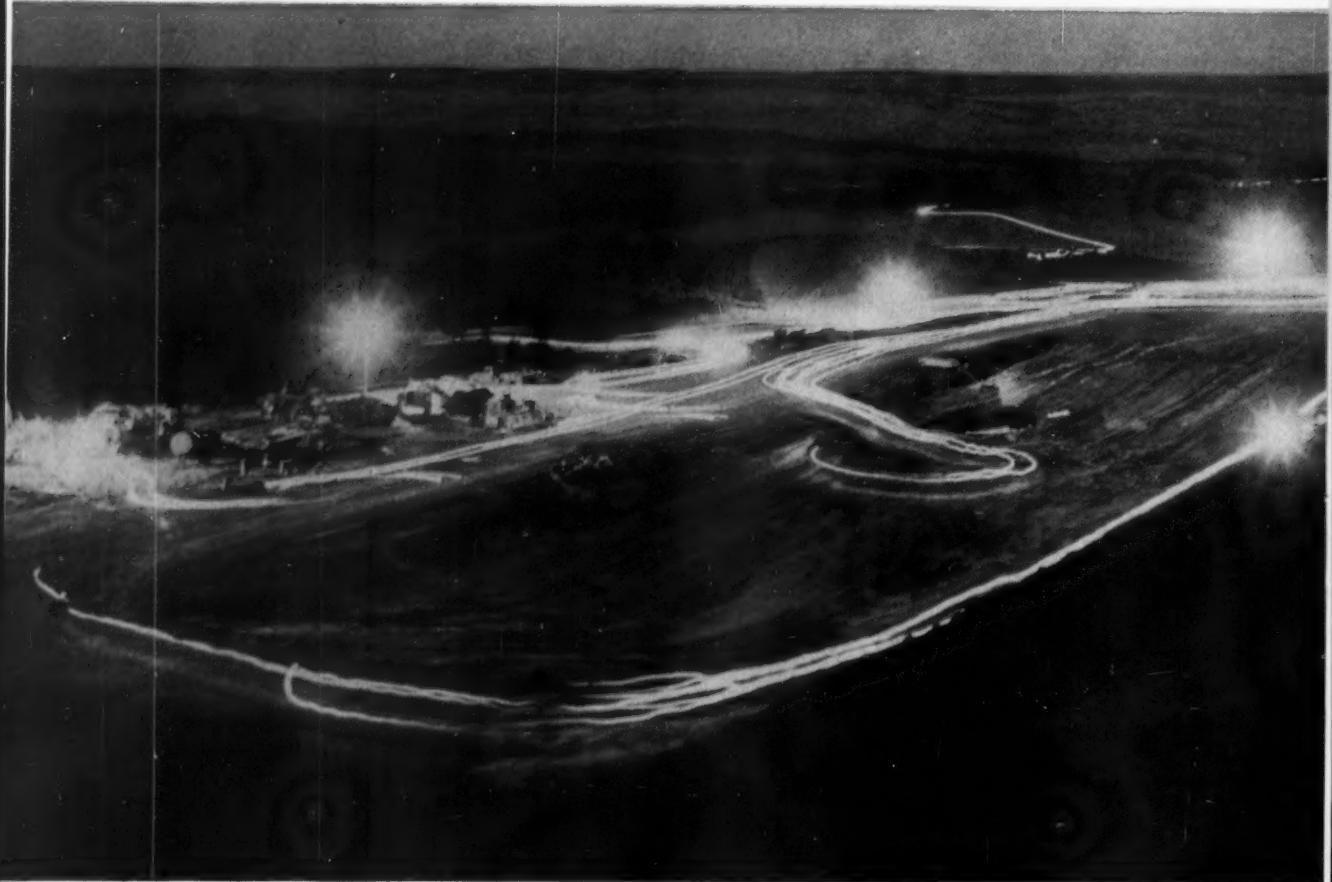
GENERAL CONSTRUCTION

(Left); 6 H.P. engine-driven, flexible shaft vibrator. Excellent for both thin and thick sections. (Right); 2½ H.P. electric vibrator (for light-socket operation). Handy as a pocket in a shirt, powerful enough to handle all general construction concrete vibration with shafts up to 28'.



Three reasons why

Contractors on the Air Force Academy Project use STANDARD fuels and lubricating oils



Night shift. \$715,000 worth of Paul Hooper, Inc., equipment moved 4.5 million cubic yards of dirt at the rate of 25,000 cubic yards every 24 hours. Leveling site for academic building area included fills of up to 100 feet.

Here are three reasons why prime and subcontractors on the \$128 million Air Force Academy project, near Colorado Springs, use STANDARD gasolines and diesel fuels plus STANOLUBE S-1 Motor Oil and other lubricants. (1) To serve contractors, Standard Oil maintains storage facilities for 82,000 gallons of petroleum products at the construction site. There's no time lost waiting for deliveries on this job. (2) Technical service on fuel and lubricants is provided contractors by experienced, qualified Standard Oil men. (3) When they buy from Standard, contractors know they are getting top quality products.

Men and machines moved seven million yards of dirt on this 17-square-mile site during 1956. Work on all phases of construction continues at top speed this year. Grading, utilities, arterial roads, sewer lines, water mains, portable water reservoirs and utility buildings are well on the way to completion. This is the sort of big construction that requires the "big" service Standard Oil gives contractor customers. Maybe you would like service such as this on your job. You can get it anywhere in the 15 Midwest and Rocky Mountain states. Call your nearest Standard Office, or write Standard Oil Company, 910 S. Michigan Avenue, Chicago 80, Illinois.



Lubrication specifications are reviewed by A. R. Gaunt (left), general superintendent of Long Construction, and Standard Oil man, Ralph Dunn. Long Construction has contract for construction of 10,000 lineal feet of concrete retaining walls. Helping contractors with lubrication is a job for which Ralph Dunn is well suited. He has been doing such work for 12 years. Ralph is a graduate of Colorado State College. He has completed the Standard Oil Company Sales Engineering School.



Nowers Construction Company is building 14 miles of primary highways. Here, Nowers Construction's president, Roy G. Nowers, and Ralph Dunn discuss lubrication of Nowers' earth moving equipment.

Despite the severe working conditions, Paul Hooper Construction, Inc., has experienced no mechanical failures due to lubrication. J. L. Phillips, general superintendent for Hooper, welcomes technical service on lubrication from Standard's Ralph Dunn.



Clifford C. Smith, co-owner and general manager of Smith-Nesbitt, and Standard's Ralph Dunn inspect part of sewer, electrical, water, steam and gas lines laid by Mr. Smith's company.



STANDARD OIL COMPANY
(Indiana)

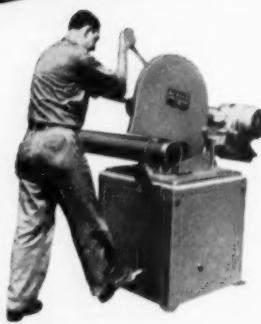


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MANY USERS ARE SAVING THOUSANDS OF DOLLARS IN METAL CUTTING COSTS!



No. 14 Beaver Abrasive Cutoff—\$540



No. 20 Beaver Abrasive Cutoff—\$995

OTHER BEAVER ABRASIVE CUTOFF MODELS

Any-Angle Cutoff • Wet Cutoff • Hi-Boy Cutoff • Oscillating-Head Cutoff • Trailer Mounted Cutoff (gas and electric driven)

LOOK AT THESE FABULOUS CUTTING TIMES!



2" Cold Rolled—
10 seconds



5" x 5" x 5/8" Angle—
12 seconds



3" Cast Iron Pipe—
6 seconds



3" U Channel—
4 seconds



4" Steel Pipe at a
45° Angle—12 seconds



1½" Aluminum Bar—
2 seconds



¾" and 1¼" Copper
Tubing—1 second



1" Formed Mild
Steel—3 seconds



Aluminum and Brass
Extrusions—1 to 3 seconds



1" Stainless Tubing—
1 second

CAN'T TELL
IT ALL HERE!

Write for latest
facts on all
Beaver Machines!



HAVE A CUTTING
OR THREADING
PROBLEM?

Let Our Engineering
Research Department
help you solve it.

hinged against a spring tension to permit the valve to be opened by a slight movement either forward or backward. The spring tension maintains the actuator in a neutral or closed position. When the driver applies pressure to the gear-shift lever grip the actuator moves slightly forward or backward against the spring tension. The power de-clutch is available on new transmissions or as a kit that allows field installation on RoadRanger transmissions equipped with either conventional lever or remote controls.—Fuller Mfg. Co., Transmission Div., Kalamazoo, Mich.



NEEDS LITTLE CARE—A new truck engine drive for Westinghouse mixers needs no more attention than a truck differential, according to the manufacturer. Unlike most front-of-engine power take-offs, the Westinghouse drive uses totally enclosed gears from the engine to the drum transmission. Two sets of bevel gears transfer power from the engine to the side of the truck frame. A drive shaft transmits power back to the drum drive transmission through two other sets of gears. There are no adjustments to make; occasional lubrication is the only maintenance needed. The drive unit includes a mechanism for adjusting engine speed for either end of the mixer. A front-end mechanical clutch is available as an option. A standard two-speed drum-drive transmission, plus reduction in the offset drive and easily adjustable engine speeds, permits all desirable drum speeds.—Westinghouse Transit Mixer Div., LeTourneau-Westinghouse Co., P.O. Box 853, Indianapolis 6, Ind.

SMALL MONITOR—Chiksan's 3-in. monitor includes many of the patented design features found on larger size models. The patented barrel design provides a smooth inside flow that checks friction loss and neutralizes forces that



WIRE ROPE AT WORK

The Roy C. Smith Bridge over the Neponset River, near Milton, Massachusetts, is an important link in Greater Boston's expanding new system of expressways. Because of its high level, this streamlined bridge is the only Neponset River crossing between Milton and the Bay

that is not subject to navigational openings:

Construction involved the placing of some heavy plate girders, and the photograph shows one of them being lowered into position. The girder is 106 ft long and weighs approximately 34 tons. Handling of the load was entrusted to strong, flexible Bethlehem wire rope, Purple Strand grade—a top-quality rope that makes even the touchiest jobs seem routine.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:
CONSTRUCTION • EXCAVATING • MINING • QUARRYING • PETROLEUM • LOGGING • MANUFACTURING





MOTOR IN HEAD

ONE MAN
White
VIBRATOR

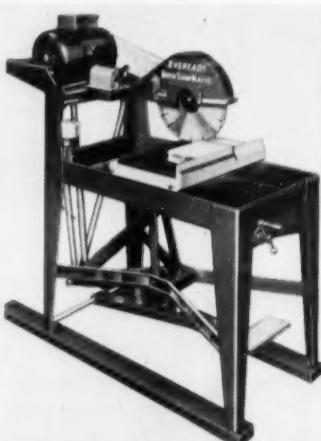
Write for prices and specifications on America's safest, easy-to-handle vibrators with 115 volt AC-DC motor in head. Also new HI-CYCLE model . . . and flexible shaft models, electric or gasoline engine.

WHITE MANUFACTURING CO.
Elkhart 6, Indiana

EQUIPMENT NEWS . . . continued



might cause a whipping action. According to the manufacturer, the new Intelli-Giant can be easily controlled with one hand even when operated manually. It delivers pressures of from 30 to 300 psi. Like its predecessors, it is designed for slurring, tunneling, scaling dam walls and settling pipe line fills. The 3-in. monitor has a 270-deg horizontal traverse and a 120-deg vertical sweep. The hydraulic controls require no power source other than water pressure that is diverted from the mainstream intake. For cold weather operation, a closed-circuit hydraulic system is available.—Chiksan Co., Brea, Cal.



FULL-VUE HEAD—Eveready Briksaw's new Briksawmatic masonry cutter features a new cutting head design, called Full-Vue, which lets the operator see what he's cutting at all times. The design also makes it impossible for him to jam his hand under the bearing housing. One simple control, an out-of-the-way crank, positions the blade height for any size of material. There are no an-

Neenah
FOUNDRY COMPANY
construction
castings
of sound quality...solid value



Patterns for
15,000 different Gray Iron Castings for
• Highway • Building • Communication
• Utilities • Industrial • Public Works
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Write for our 135-page
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NEENAH, WISCONSIN CHICAGO OFFICE
5445 North Neva Ave.
Chicago 31, Illinois

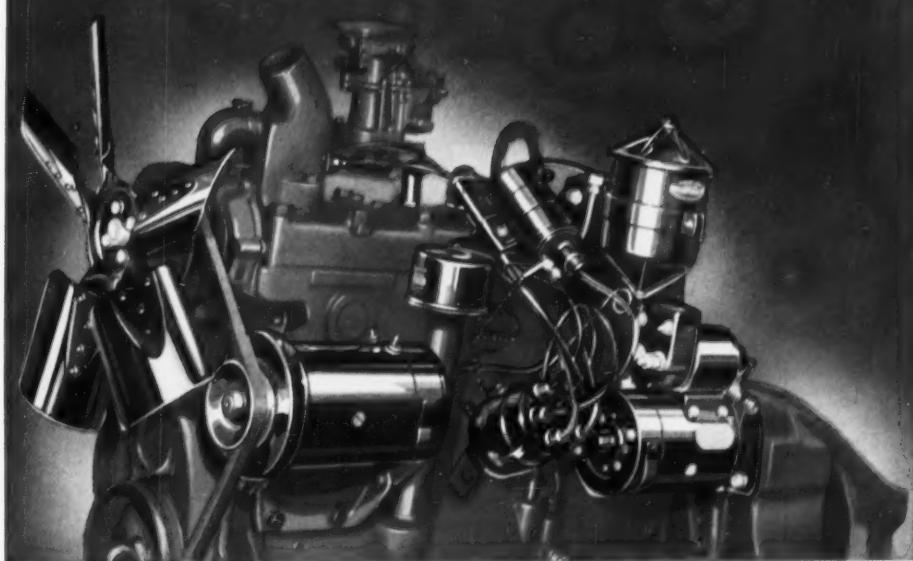
Fix a big mix...



Rex 6½ yard Moto-Mixer is built for peak efficiency by CHAIN Belt Company. Exclusive drum blade design provides improved mixing action, fast discharge. Rear mounted engine and transmission places center of gravity nearer the front axle for better weight distribution, maximum payload. Rugged Chrysler Power—available with gyrol fluid coupling—assures low cost, trouble-free operation at all times.



THE PAYOFF POWER IS CHRYSLER



CHRYSLER INDUSTRIAL 30

in-line 6 Engine (230 cu. in. displacement) powers Rex Moto-Mixer—and many other makes of equipment in the construction and materials handling field. There are four Chrysler in-line 6s, two V-8s—ranging from 230 to 354 cu. in. displacement.

Chrysler
INDUSTRIAL ENGINES

INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION

Write Dept. F-9, Industrial Engine Division, Chrysler Corporation, Detroit 31, Michigan, or see your nearest Chrysler Industrial Engine Dealer.

For specific detailed information For descriptive literature

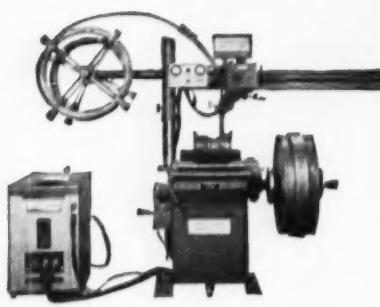
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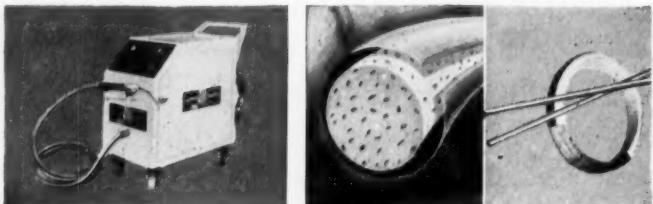
CITY _____ ZONE _____ STATE _____

How AMSCO helps you fight wear...

AMSCO® HARDFACING WELDING EQUIPMENT AND MATERIALS

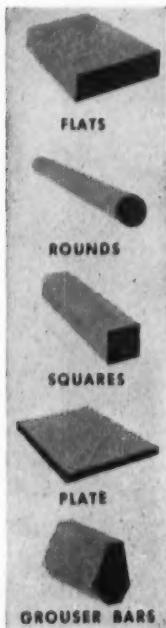


Automatic welders



Semi-automatic MF welders Manual, automatic rods & electrodes

Now you can get a hardfacing material to lick every type of wear. Impact alone! Impact plus abrasion! Abrasion alone! Amsco's line is complete and includes the new high-speed, more economical *tube rod* for semi-automatic build-up and repair. You'll save hours of down time, reduce welding time and materials cost . . . plus extending service life of your equipment . . . by using Amsco machines and hardfacing materials. Write for a complete description of this wear-fighter line.



AMSCO SHAPES • REPOINTERS of 12-14% manganese steel

Reinforce points of extreme wear with work-hardening Amsco 14% manganese steel shapes. Truck beds, chutes, crushers, blades, dippers . . . wherever impact and abrasion cause early wear-out. Amsco shapes are easy to weld, manganese to manganese, or manganese to carbon steel. Size range is complete to fit all equipment.

Cast-to-shape repointers

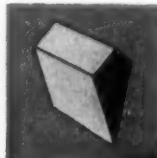
For fast, easy re-pointing of teeth used in less severe digging.

Repointer bars

Three-foot bar lengths. Also ideal for rebuilding worn lips of all digging equipment.

Wear-Sharp repointers*

Work up to 6 times longer than standard repointers. Corners won't blunt. Entire cutting edge wears evenly. *Patented



Amsco Welding Products distributed in Canada by Canadian Liquid Air Co., Ltd.



AMSCO

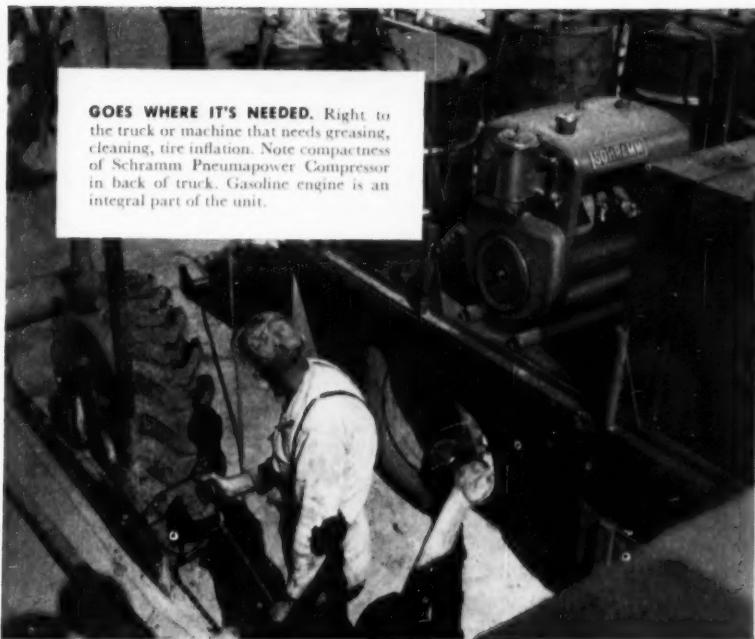
AMERICAN MANGANESE STEEL DIVISION
CHICAGO HEIGHTS, ILLINOIS

gle adjustments to make because the cutting head is always level. The Briksawmatic is powered by a 2-hp, continuous duty, totally enclosed motor. Other features include a blade pressure equalizer that automatically protects the blade from shock; a dual-voltage switch that allows changes from 115 to 230 v without rewiring; and an electric water pump that directs water to the blade effectively.—**Eveready Briksaw Co., Dept. 543, 1509 S. Michigan Blvd., Chicago 5, Ill.**



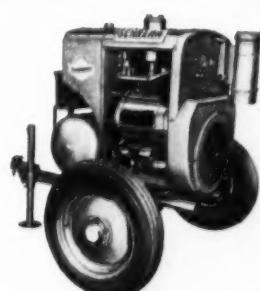
TRANSMISSION DOLLY—A hydraulically operated sliding platform that tilts and moves either backward or forward is one of the features of a newly designed truck transmission and differential dolly offered by Cam Tool Co. A hydraulic jack mechanism controls forward movement and heavy springs return the platform to position. An additional hydraulic jack raises the platform to 39 in., which is well above normal work bench height. Hold-down pads on each leg eliminate roll-around action, by firmly locking the dolly to the floor. The unit has a rated capacity of over 1,500 lb. —**Cam Tool Co., Inc., 1038 Larkin St., San Francisco 9, Cal.**

AIDS OPERATOR—Besides acting as an additional safety device, the Boom Spot indicator gives operators better control over all phases of boom operations. It is especially effective where reproducible spotting is necessary. The device is easily installed on any boom rig from 35 to 170-ft long. Mounted in the cab

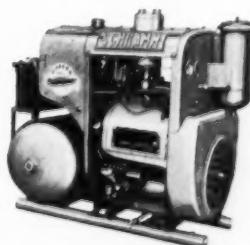


GOES WHERE IT'S NEEDED. Right to the truck or machine that needs greasing, cleaning, tire inflation. Note compactness of Schramm Pneumapower Compressor in back of truck. Gasoline engine is an integral part of the unit.

Don't send a man on a boy's errand



NO TYING-UP OF HEAVY COMPRESSORS. Light, fast-moving Schramm 20 or 35 cfm Compressors do equipment maintenance work at far less cost. Two wheel mounted unit is ideal for jobs where hauling expense and fuel costs of larger units must be avoided.



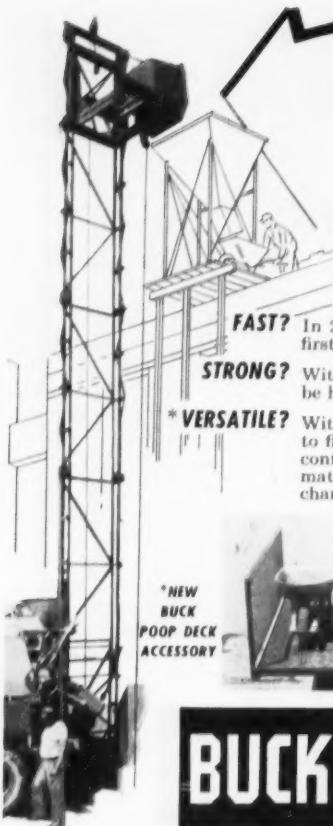
SKID MOUNTED UNIT requires very little space. Ideal for installing in small shops or on rear of truck. A handy unit for hauling to jobs for emergency repairs, operating grease gun or general maintenance work.

Fuel cost and hauling expense go kiting when you tie up a large-capacity air compressor on construction machinery maintenance. But costs dip sharply when you clean, inflate tires and lubricate with a Schramm 20 or 35 cfm Pneumapower Compressor. Here is the smallest, lightest, most compact, gasoline engine powered compressor on the market. Tow it easily on its rubber tired wheels or skid it into the back of a truck. It's just what you need for servicing equipment—or for occasional, small air tool jobs. And it's a heavy duty unit, built to take 'round-the-clock punishment with almost no maintenance. Bulletin 5701-20-35 contains full information. Write for your free copy—or ask your local Schramm Dealer for a demonstration.

Schramm, Inc.

MANUFACTURERS OF AIR COMPRESSORS

604 North Garfield Ave. • West Chester, Pa.



BUCK puts Concrete where YOU need it... when YOU need it

Avoid costly down-time. The Portable Buck Hoistower equipped with the $\frac{3}{8}$ cu. yd. clean-dumping concrete bucket actually moves 97 yards of concrete . . . and more . . . in three hours.

FAST?

In 23 minutes—from towing to working—your first load of concrete is up.

STRONG?

With the new 25 hp. engine a 2500 lb. load can be hoisted 100 ft.—and then some!

*VERSATILE?

With the new Buck Poop Deck accessory—built to fit any old or new model Buck Hoistower—contractors can hoist loads of masonry and other materials in between concrete loads without changing the platform.



BUCK EQUIPMENT
CORPORATION

720-B ANDERSON FERRY ROAD,
CINCINNATI 38, OHIO

In Canada: London Concrete Machinery Company
London, Ontario

In England: Millers Machinery Co., Ltd.
London, E.C. 2.

Whether it be the platform, concrete bucket, Buck Poop Deck or Chicago Boom, depend on Buck.

For free literature—and to action test this machine—see any of the 73 Buck dealers or write direct.

RUGGED is the word
PERFORMANCE
is the **PROOF!**

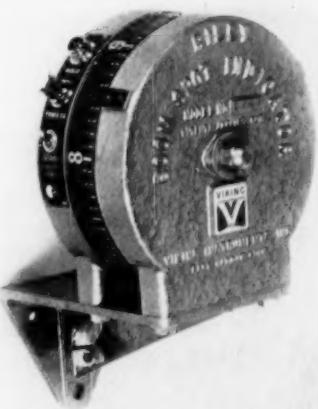
You're hours and dollars ahead with MADESCO blocks on the job—they're *engineered* to shrug off the relentless beating that gruelling construction work involves. Around the clock and around the calendar you can be sure that MADESCO blocks have the ruggedness to serve you well . . . reflecting 30 years of specialized engineering in hoisting. Extra heavy space-saver crane hook blocks, extra heavy weighted blocks are among a *complete* line to exactly meet your needs. Consult your supplier or write our engineering department.

MADESCO
BLOCKS

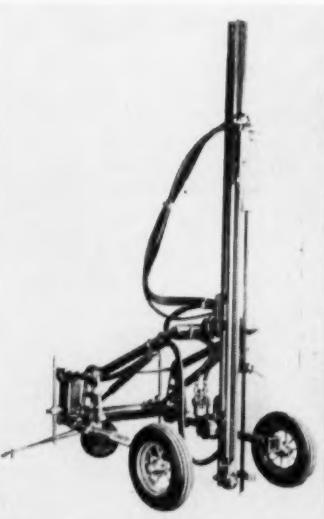
HAE MA 362-457

MADESCO TACKLE BLOCK CO.
MAIN OFFICE & PLANT, EASTON, PA.

EQUIPMENT NEWS . . . continued



house, it is read easily by the operator and is controlled by a cable attached to the boom. The cable transmits to the operator a numerical reading of the boom angle at all times. An integral signal light gives a red flasher warning when the boom is about to enter a dangerous position. The device is useful for operations requiring blind sighting, for casing work, and for night duty.—Viking Instruments, Inc., East Haddam, Conn.



BETTER WAGON DRILL —

When compared with Schramm's earlier drills, the new Schramm DR-126-A wagon drill features longer feed travel, a greater range of feed pressures, a new down-pressure motor, and a new line oiler. The drill uses a standard Schramm 4-in. drifter with 10-ft feed travel for 8-ft steel changes. Other improvements include a

GENERAL

NYGENTM
TIRES



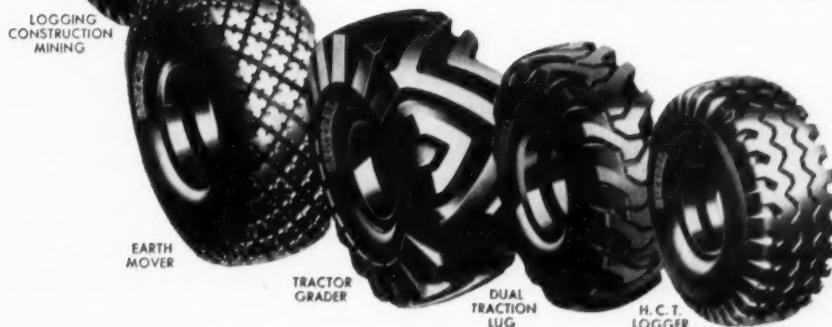
Built to keep your equipment on the "GO" for profit!

Where any job calls for extra strength and stamina, for power traction and dependable trouble-free performance, make your first choice General Truck Tires. Built with exclusive stronger-than-steel Nygen Cord, General Tires provide maximum protection against job hazards . . . keep your equipment moving on schedule for positive profits.

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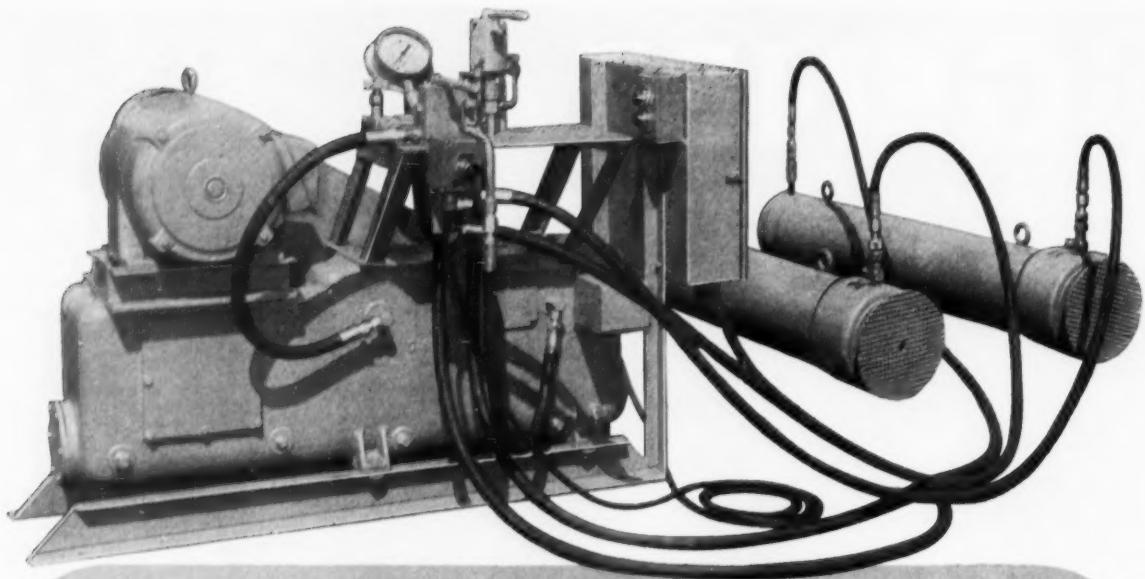
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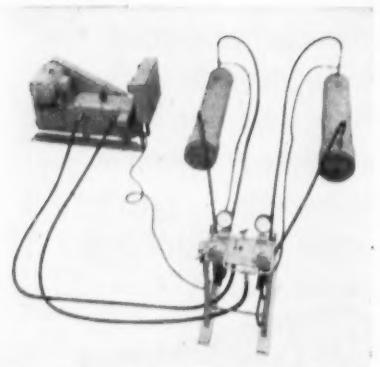
THE GENERAL TIRE & RUBBER CO. • Akron, Ohio

September 1957 — CONSTRUCTION METHODS and Equipment — Page 245



Rodgers Hydraulic Prestress Units

For the best operation of your beds!



The remote control station can be converted to control any one of the other three hydraulic circuits by making a few simple changes in valving.

Now available in many models to operate one or more jacks. Control panel may be mounted directly on the pump (as shown above) or with a separate remote control panel that can be placed in any desirable position for servicing of several beds (shown at left).

You have a selection of four hydraulic circuits with positive controls for pretensioning as well as detensioning steel strands. Jacks are offered with ram travels of 30 to 48 inches and in capacities from 50 to 600 tons.

You'll find a Rodgers Hydraulic Prestress Unit just suited for your prestressed installation. Ask for Rodgers Catalog 332 or request information on any special requirements for the application of hydraulic power in your operations.

Rodgers Hydraulic Inc.

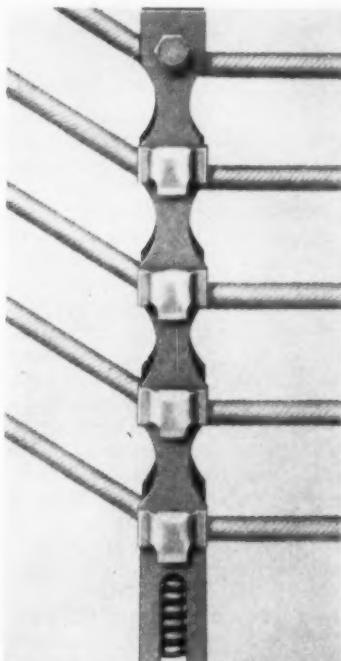
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Rodgers Hydraulic
jacking equipment
for all purposes
... also cylinders,
pumps, control valves.



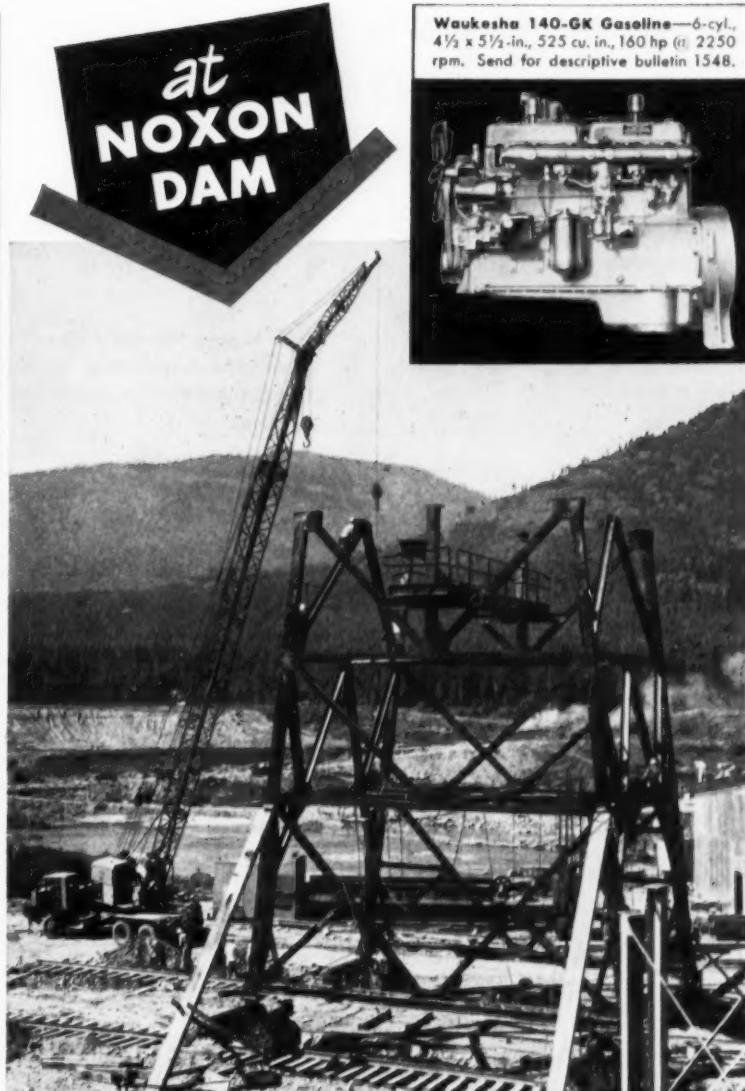
EQUIPMENT NEWS . . . continued

double-cylinder, seven-blade air motor. Supply air can be throttled for an infinite number of feed pressures. Other features include a new feed chain take-up, a new 2-gal line oiler, and a device called the Schramm Centralizer that prevents the drill from walking once a hole is started.—**Schramm, Inc., 900 E. Virginia Ave., West Chester, Pa.**



RESTRAINTS CABLES—A new hold-down device for restraining wires and cables in prestressed beams and girders has been developed by Superior Concrete Accessories, Inc. The hold-downs are designed to hold strands in the approximate path of position of a catenary curve. One to seven-strand models are available. Safe load on a seven-strand hold-down is approximately 14,700 lb. The units are held in position by $\frac{3}{4}$ -in. high tensile coil bolts.—**Superior Concrete Accessories, Inc., 9301 King St., Franklin Park, Ill.**

HYDRAULIC DRIVE—An optional hydraulic drive system for the various components of its crushing plants has been developed by Lippman Engineering Works, Inc. The new drive system is said to cut noise and vibration and to improve power transmission by providing a steadier flow of horsepower. Be-



Morrison-Knudsen own and use Lorain Crane

powered by
WAUKESHA

For the Noxon Rapids Hydroelectric Project on Clark Fork River in western Montana—Morrison-Knudsen Co., Inc. of Boise, Idaho are building a concrete and earth fill dam, maximum height 190 ft. and about 5930 ft. long. About the busiest piece of equipment on the job is their Waukesha-powered Lorain MC 505-W mobile crane. After setting up a concrete batch plant, it is shown here setting up a two whirley crane plant. The Lorain's 140-GK Waukesha Engine gives it safe, steady power with ready reserve for heavy handling as well as fast power for speedy mobility.

353

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN
NEW YORK TULSA LOS ANGELES

A grain elevator gets a good going over, INSIDE, OUTSIDE!



COMPLETE BREAK-THROUGH IN WALL

How to save this costly structure, without rebuilding sections, presented a serious problem.

Workmen on scaffolds, from inside and outside, cut out deteriorated concrete.

Necessity of costly forming was eliminated by the use of THORITE 20-minute set, nonshrink, filling and patching mortar.

THORITE

THORITE permits completion of job in one fall of scaffold, followed immediately by THOROSEAL seal coat.



Air hammers cut away loose and crumbling concrete. THORITE formed into cleaned-out sections, with a minimum labor cost, restored elevators to original condition.

Job completed with the application of THOROSEAL over entire structure.

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EQUIPMENT NEWS . . . continued



cause power is held within the driving mechanisms themselves, without transmitting vibrations to the substructures, the hydraulic drive system also cuts wear and tear on the various plant mountings. On the Comanche dual crushing plant pictured, all drives except the ones to the jaw and roll crushers are hydraulic. (Lippman is presently developing hydraulic units of adequate size to power these components.) Hydraulically driven components on the Comanche include all hoppers, grizzlies, feeders, and conveyors. Oil is pumped through flexible pipe lines from a central reservoir to hydraulic motors mounted individually as driving units on the various plant components. Return lines bring oil back to the reservoir tank. Pressure is constantly and automatically regulated to provide whatever power is required for each drive. The light weight of the hydraulic equipment, and the ease with which it may be hooked-up, contributes to the portability of the plant. Other hydraulically driven Lippman plants are being tested.—**Lippman Engineering Works, 4603 W. Mitchell St., Milwaukee 14, Wis.**

CHECKS ROAD MIXES—A new device permits constant visual observation of the flow of air entraining agents in concrete road mixes. Called the Acme a.e.a. dispenser, it is mounted on road pavers or stationary mixers and dispenses a fixed amount of air-entraining agent into the water line. The discharge is timed so as to reach the water approximately 1 sec before the water is released from the measuring tank, thus insuring proper gage-water addition. The dispenser cylinder and

Two-fisted for tough going!



Your Diesel engines run better, last longer when you change to Sinclair Super TENOL® Motor Oil.

Sinclair Super TENOL safeguards your equipment against the damaging effects of high temperature and continuous stop-and-go operation.

Sinclair Super TENOL withstands such punishing conditions because it's specially made for tough going. High viscosity index base oils, combined with an exclusive formula of selected additives, give your Diesel the greatest protection against varnish, sludge, rust and acid corrosion.

Refill now with Sinclair Super TENOL Motor Oil. Contact your local Sinclair Representative for further information, or write Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N. Y. *There's no obligation.*

Dino, the Sinclair
Dinosaur, says:



SINCLAIR **SUPER TENOL®**

how to get the most out of HOLLOW DRILL STEEL

Detachable carbide insert bits are a cost-cutting tool for the hard rock driller. But their use presents problems to the blacksmith. One problem is the premature failure of the attachment on the drill rod. When that happens, time is wasted in trying to recover the bit and, often, valuable bits are lost.

But, with new alloy steels such as Crucible CA DOUBLE DIAMOND or 4E, plus careful control of operations in the forge shop, you can keep failures to a practical minimum.

For example, prevent SCALING OF THREADED SECTION



Excess scaling may produce undersize threads, loose fitting bits and ultimate mechanical failure of the drill rod due to poor stress distribution. Here are a few precautions to take to prevent excess scaling:

TIME AND TEMPERATURE—



Of primary importance are the time and temperature which the heat-treater selects for the job. Although they will vary somewhat with the composition of the steel and the size of the rod, time and temperatures should be selected which are the minimum at which the desired result can be obtained. Excess furnace time or temperature will result in excessive scale formation.

FURNACE ATMOSPHERE — Avoid a highly oxidizing flame. The higher the excess oxygen content, the greater the tendency for scale and decarburization to form. And a reducing flame leads to carburizing brittle threads. The furnace best operates with a "soft" smoky flame or under near neutral conditions.

SCALE REMOVAL—



Scale is abrasive, and unless what scale does occur is removed, thread wear results. Wire brushing is a fast, convenient and safe method for removing scale.

Crucible hollow drill rods are tough, strong—made to tool steel standards. Their extra quality means less rod breakage—fewer valuable bits lost. So specify Crucible hollow drill rods for your next job. They're quickly available in the sizes, types and grades you need. *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

CRUCIBLE

first name in special purpose steels

Crucible Steel Company of America

HOW TO HANDLE WET JOBS

IS THIS A RECORD FOR DEWATERING SILTY SAND & CLAY?

Concrete box culvert, Old Bridge, N.J.
Contractor: Almeida Construction Co.



PHOTO, JUNE 1—Griffin equipment shipped that day. Difficult swampy soil required use of specially designed sand filters around the wellpoints.



JUNE 4. Wellpoint system installed over weekend and excavation well under way. Actually, the 5 ft of water was under control just 20 minutes after pumping started.

That's how skillfully the filters were designed. P. S. Álmeida called Griffin on the recommendation of a contractor friend. Ask your friends about Griffin.

GRIFFIN

WELLPOINT CORP.

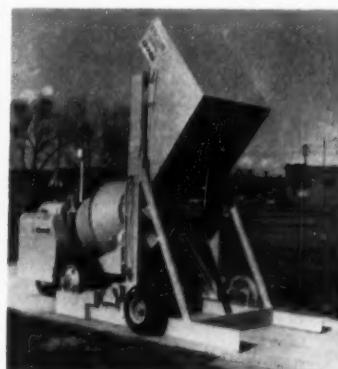
881 East 141st Street, New York 54, N.Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.

In Canada: Construction Equipment Co., Ltd.
Toronto Montreal Halifax

EQUIPMENT NEWS ... continued

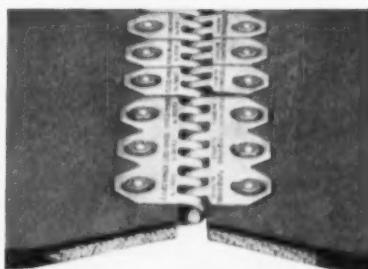


the breather tube are made of Cadco transparent plastic and the discharge tube is transparent flexible vinyl. The device is available on equipment manufactured by Blaw-Knox, Chain Belt, Koehring, and Worthington.—E. W. Zimmerman, 228 N. LaSalle St., Chicago 1, Ill.



SELF-CONTAINED PLANT—The Drive-A-Mix is a self-sufficient, mobile concrete mixing and batching plant that can deliver up to 20 cu ft of concrete every 5 min. The self-propelled mixing unit is powered by a 26.8-hp Kohler engine and it has a top road speed of 12 mph. The unit can travel over hilly terrain and through mud and loose gravel on big rubber tires. A tricycle-type steering gear permits the unit to make 360-deg turns in 15 ft. Only two men are required to mix, deliver, and transport concrete and buggies and additional help are not necessary. The mixer carries its own water supply in tanks

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500X FLEXCO HINGED BELT FASTENERS

*for ditching, trenching,
grading and other
earth moving equipment*

- ★ Make smoother joints
- ★ New Nylon covered cable pin
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- ★ Packaged joints — complete, convenient, no waste.
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(Fasteners also available in bulk — nylon covered cable pin stock in 100 ft. and 200 ft. rolls.)

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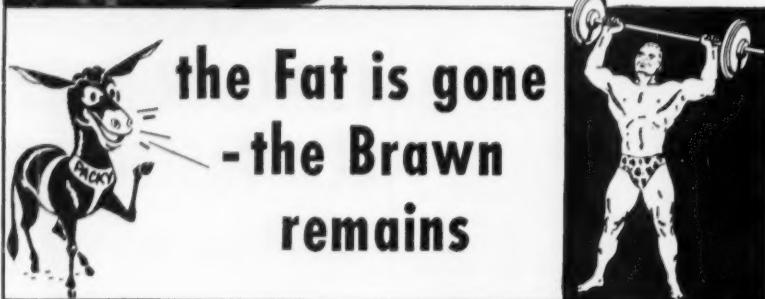
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500X Belt Fasteners



EQUIPMENT NEWS...continued

with a capacity of 104 gal. Five loads can be mixed without refilling. The self-propelled mixer pulls a portable batcher that has its own power plant. It is charged by tractor loaders while on the ground level, and then it is power-raised (above) to charge the mixer. The hopper has a capacity of 1 yd. The versatile mixing unit is only 7 2/3 ft high, 74 in. wide, and 11 1/2 ft long. Its gross weight is only 3,460 lb.—Good-All Electric Mfg. Co., Ogallala, Neb.



Judicious use of alloy steel, to produce a lightweight trailer with more than adequate strength is a Rogers accomplishment in the popular LT Model.

Attractively priced, it meets the demand for more payload per pound of trailer weight.

Available in 15, 20, 25, 30 and 35 ton capacities; it is similar in general design and equipment to Rogers standard models.



*One of several Rogers *TILT-DECK Rogers trailers.*

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ROGERS BROS. CORP. ALBION, PENNA.

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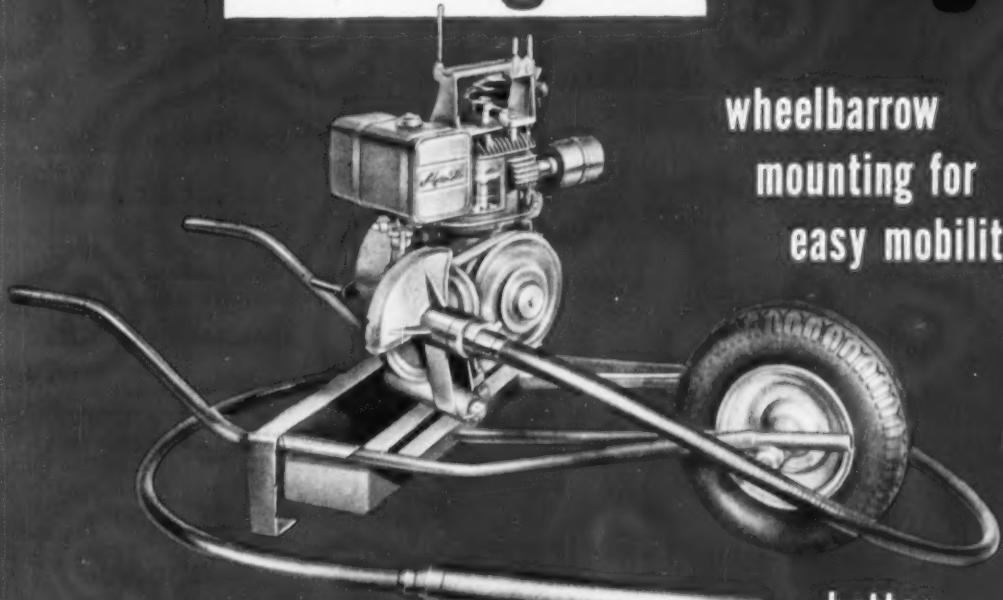


PRESTRESSED VIBRATOR—Viber's new 17-lb concrete vibrator offers the high speed and low amplitude that is necessary to secure proper consolidation of low slump concrete used in prestressed operations. The 10 1/2-in. long head, only 1 5/16-in. dia, is ideal for stems of T members and other hard-to-reach parts of prestressed concrete forms. Interchangeable, flexible shaft drives are available in 14 and 24-in. lengths. The light weight of the unit makes it easy to carry the long distances encountered in prestress casting yards. A replaceable rubber tip is standard and a variety of 15/16-in. dia steel tips also are available—Viber Co., 726 S. Flower St., Burbank, Cal.

continued on page 255

now, in concrete vibrators, too,

if it's Remington, it's right



The famous 7GVW21 Concrete Vibrator
has 4 great features that make it right for you!

- Dependably powered by rugged single-cylinder, 4-cycle air-cooled gasoline engine with countershaft drive and automatic clutch.
- This versatile unit can also be used to power attachments for concrete surfacing, sanding, wire brushing, pumping and other jobs.
- Long-reaching flexible shaft made up of 7 ft. or 14 ft. sections. Extra sections can be added as needed.
- Unit can be moved right along with the work on pneumatic-tired wheelbarrow mounting. This unit is also available on 360° swivel round base mounting.

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concrete at
lower cost!

MODEL 7GVW21 5 HP concrete vibrator. Available with $2\frac{1}{2}'' \times 20''$ 7,000 RPM vibrating head or $2\frac{1}{2}'' \times 12''$ 10,000 RPM vibrating head.

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Electric impact wrenches speed up work on heavy equipment

You'll use less cement, coarser aggregate and produce denser, more uniform concrete...and do it in fewer man-hours!

That's a mighty big order to be sure! But it's being done every day on every kind of concrete job by these indispensable vibrators by Remington—the newest name in power tools and famous for 141 years for quality in sporting firearms and ammunition.

You name it...Mall Tool Company, Division of Remington Arms Company, Inc., gives you a vibrator for every application from small form work to large mass concrete compaction. Over a dozen models, most available in gasoline engine, electric or pneumatic, including the new 1-man 115-volt vibrator with motor-in-head. Let us send you our latest catalog today!

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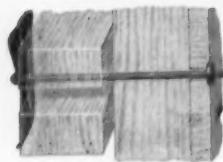
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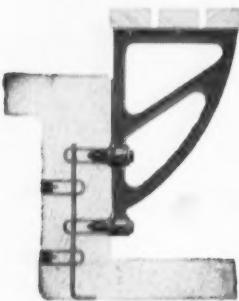
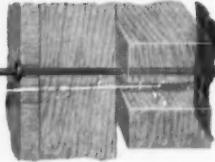
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SUPERIOR

All the Accessories For
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PANEL LOCK BOLTS



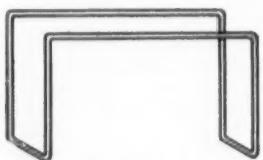
ROD CLAMPS



STANDARD HANGER FRAMES



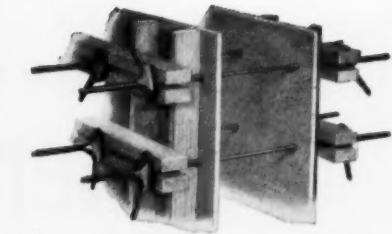
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**"PICK-UP" INSERTS
FOR TILT-UP SLABS**

Shown here are some of the many types of Form Ties, Anchors, and other concrete accessories which SUPERIOR'S years of engineering and field experience plus manufacturing dependability have developed and produced.

Every item in the SUPERIOR line is specifically designed to provide the most dependable and efficient forming method for ordinary foundations, engineering structures, watertight walls and architectural concrete.

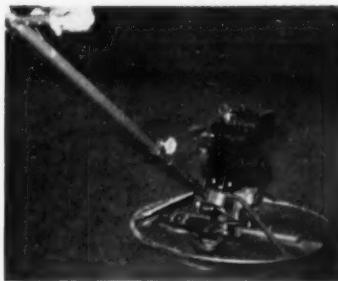
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9301 KING ST., FRANKLIN PARK, ILL. (A Suburb of Chicago)

New York Office: 1775 Broadway, New York 19, N.Y.
Pacific Coast Plant: 2100 Williams St., San Leandro, Calif.



34-IN. TROWEL—The four-blade feature of Stow's new 34-in. troweling machine makes it so easy to operate that even a novice can obtain a smooth floor, according to the manufacturer. The machine, called the G34-4, comes with four finish and four float blades. Both sets are reversible. The trowel is powered by a 2½-hp engine. It has a manual clutch control that stops the blades from rotating without stopping the engine when the operator releases the handle. The handle of the G34-4 is easily adjustable to suit the desires of the operator.—**Stow Mfg. Co., 31 Shear St., Binghamton, N.Y.**



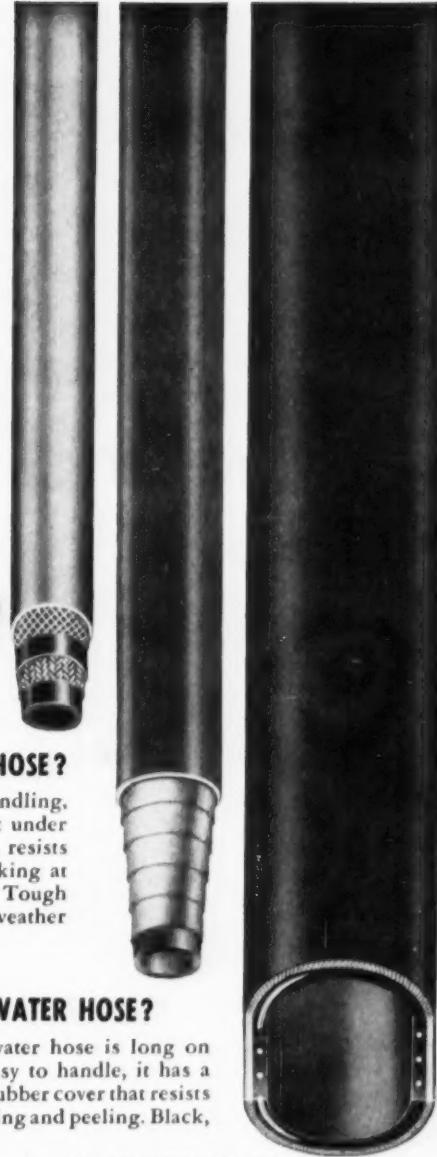
AIR LUBRICATOR—A portable hand lubricator—said to be the first completely self-contained, air-primed unit on the market—has been introduced by the Aro Equipment Corp. Called the Aro-Pak, the unit has a 5-lb grease capacity and it weighs only 15 lb fully loaded. It is permanently air-

Which QUAKER HOSE do you need today...

to cut costs tomorrow?

Rugged, non-twisting AIR HOSE?

Though lightweight for easy handling, this hose won't snake or twist under pressure. It takes dragging . . . resists oil damage . . . withstands cracking at temperatures as low as 20°F. Tough Neoprene cover withstands all weather conditions.



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This all-purpose water hose is long on wear and value. Easy to handle, it has a black, high-grade rubber cover that resists sun, weather, cracking and peeling. Black, non-porous tube.

Strong, durable SUCTION HOSE?

Here's a rugged, long-lasting hose for conducting water under pressure or suction. It resists kinking and crushing and has good sun, weather and abrasive-resistant qualities. Tube resists action of water containing light concentrations of alkalies, acids, grit and sand.

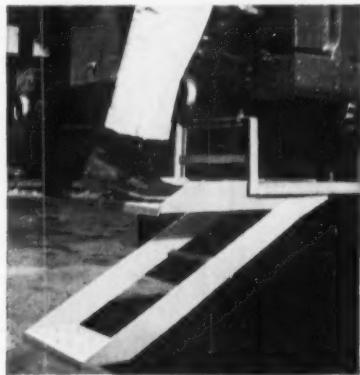
THESE are but a few of the many types of air, water and suction hose your Quaker-Quaker Pioneer distributor has on hand and ready to go. Call him—whatever your needs. For free brochures, write:

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H. K. PORTER COMPANY, INC.
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Take the danger out of this zone!



BULLARD Truck Safety Steps

Statistics prove 40% of truck accidents occur in this zone, where trucks are loaded and unloaded. Low cost, Bullard safety truck steps make this area as harmless as your own front steps. They speed handling, and reduce worker fatigue. Permanent installation can be made by bolting or welding to truck frame. When not in use, step folds flush to rear of truck...or, if truck backs into loading platform with step down...it automatically retracts without damage. Special non-skid treads—side latch locks step in place.

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E. D. BULLARD COMPANY, Sausalito, California

EQUIPMENT NEWS...continued

primed with a maximum pressure of 7,500 psi. Hung over the shoulder, the lubricator can be operated with one hand, leaving the other hand free for the operator to support himself while greasing out-of-the-way fittings. The Aro-Pak can be re-filled in seconds, and it is not affected by cold weather.—**Aro Equipment Corp., Bryan, Ohio.**



TOUGH HOSE—Acme's new line flexible, wire-braided air hose will take working pressures up to 1,500 psi. Called Acme Gold Seal air hose, it is designed for heavy-duty compressors, wagon drills and jumbos. The wire braid makes it particularly suitable for jobs where external abrasion on the hose is a problem. The hose consists of a thick neoprene tube, a one or two-strand wire braid, and an abrasion-resistant, hard rubber covering, colored yellow to make it easily visible. It is available in ID sizes from $\frac{1}{2}$ through $2\frac{1}{2}$ -in. A 100-ft roll of the $2\frac{1}{2}$ -in. size weighs 227 lb.—**Acme Rubber Mfg. Co. Div., Acme-Hamilton Mfg. Co., 115 Meade St., Trenton, N.J.**

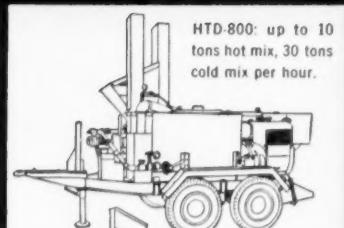
SELF-PROPELLED COMPACTOR—Chester's new multi-wheel pneumatic compactor has nine rolling wheel with 7.50-15 smooth tires that are pair-mounted for maximum oscillation. Maximum compactive effort is 2,000 per wheel with water ballast and six-ply tires inflated to 34 lb. The body is constructed with a drop-center design that maintains a low center of gravity. The unit has four wheels in front and five rear wheels that extend beyond the body to permit operations close to obstacles. Rolling width is 66 in., ground clearance is 15 in., and



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McCONNAUGHAY ASPHALT MIXERS



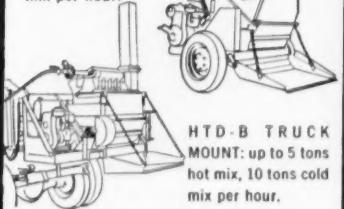
HTD-800: up to 10 tons hot mix, 30 tons cold mix per hour.



HTD-500: up to 7 tons hot mix, 15 tons cold mix per hour.



HTD-B: up to 5 tons hot mix, 10 tons cold mix per hour.



HTD-B TRUCK MOUNT: up to 5 tons hot mix, 10 tons cold mix per hour.

For details and specifications, write, wire or phone . . .

K. E. McCONNAUGHAY LAFAYETTE, INDIANA

National distributors: Asphalt Equipment Co., Inc., 3314 Cherry Lane, Fort Wayne, Indiana

FULLER ROADRANGER® Transmission standard in new LeT-WesCo truck

Fuller's 9-speed R-1150 ROADRANGER Transmission was selected for the revolutionary new 30-ton LeTourneau-Westinghouse off-road hauler "... because of the wide range of gear selection and speeds, plus the fact that it shifts easily and quickly."

Merle R. Yontz, President, says: "We wanted a tough, fast, high-production hauler which would be cheaper to run, simpler to maintain, and easier to operate—one that would make more money per trip for its owners."

So, the LW-30 features the new Fuller R-1150 ROADRANGER Transmission, designed specifically for extremely heavy-duty off-highway service. Advantages:

- No gear splitting—9 selective gear ratios are evenly and progressively spaced
- Pre-selective countershaft brake for easier, quicker shifts
- Average 38% between ratios
- One shift lever controls all 9 forward and 2 reverse speeds
- Engines operate in peak hp range with greater fuel economy
- Less driver fatigue—1/3 less shifting than with comparable multi-speed transmissions
- Range shifts pre-selected—automatic and synchronized

Check with your local truck dealer for the *right* Fuller Transmission for your job.

New LeT-WesCo LW-30 truck, powered by 375 hp Cummins 4-cycle, turbo-charged, V-8 engine, features Fuller 9-speed R-1150 ROADRANGER Transmission.



FULLER MANUFACTURING COMPANY, Transmission Division, Kalamazoo, Michigan • Unit Drop Forge Division, Milwaukee 1, Wisconsin • Shuler Axle Company, Louisville, Kentucky (Subsidiary) • Sales & Service, All Products, Western District Branch, Oakland 6, California and Southwest District Office, Tulsa 3, Oklahoma.

FULLER

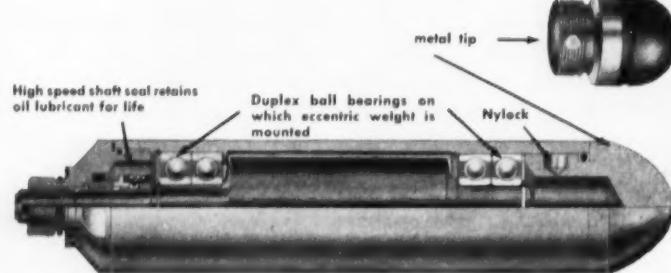
TRANSMISSIONS

In Concrete Vibrators, it's the WALLOP that counts!

"Wallops", which is what many contractors call amplitude, is what it takes to vibrate a stiff mix—quickly and thoroughly. Recent tests prove that the efficiency of vibration increases in proportion to the amplitude. Therefore, Stow Manufacturing Co., Binghamton, N. Y., has developed a lightweight rugged vibrator head that packs a terrific wallop.



Rugged new Stow 2 HP BU electric vibrator. It has Underwriter's Laboratories listing for 50/60 cycle AC operation.



Take a look at this vibrator head. It is 10 inches long, and available in diameters of 1½, 2 and 2½ inches, capable of 9000 VPM. Vibrations are achieved by use of an eccentric weight mounted in special high speed duplex ball bearings at each end. The outside of the head is case hardened, for extra long wear, and it has a replaceable tool steel tip. Stow estimates that these two improvements alone will double the life of the heads.



Big 5.6 HP Stow AG vibrator.

Construction men report that they like the light weight, the long life, the low replacement cost, and the terrific wallop of these heads. Weight of the 1½" head is about 5 lbs.; the 2" head about 7½ lbs.; the 2½" head, about 9 lbs. The cost of this head is less than 1/3 the cost of expensive "motor-built-in" type heads. The 1½" head is also available with a hard rubber tip for use where plywood forms are being used.

For more information about the complete line of STOW concrete electric and gasoline vibrators, vibrating screeds and rotary trowels, contact your STOW distributor by looking in the yellow section of your telephone directory under "Concrete Vibrators" or write for STOW Catalog 560.

STOW

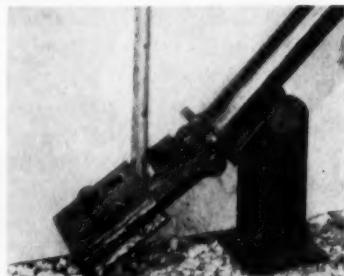


STOW MANUFACTURING CO., 31 Shear St., Binghamton, N. Y.

EQUIPMENT NEWS ... continued



body height is 52 in. Features include power steering, double-disc brakes, and a 38-hp gasoline engine. The transmission provides six speeds forward, from 1.8 to 9.5 mph, and two speeds in reverse. Optional equipment includes a diesel engine, torque converter with an automatic reversing transmission, additional water ballast tanks, and front and rear-wheel mats.—Chester Products Co., N. 5th St., Hamilton, Ohio.



PULLS STAKES—The adjustable plate on the jaw of the Universal stake puller will accommodate every type of steel or wood stake. It will pull steel pipe or rods $\frac{1}{4}$ to $2\frac{1}{2}$ -in. in dia and it can be used to pull rods from concrete walls. Its advantages are that it does the job quickly and easily without damaging stakes or rods.—Universal Form Clamp Co., 1238 N. Kostner Ave., Chicago 51, Ill.

DIAPHRAGM PUMP—Layton's diaphragm type pneumatic pump is readily adaptable to deep shaft work where it will pump with a head of 100 ft or more, according to the manufacturer. The pump ejects fluids with as high as 60% solids, and it can handle highly abrasive liquids for extended periods. Fluids are bypassed from the suction line directly into the discharge outlet and do not con-

MALSBARY MAINTENANCE CLINIC

Mobile Steam Cleaners Pay Off



"All Equipment gets more frequent attention; no trucks or graders need be out of action long for cleaning; and the cleaner adds punch to our toughest assignment, keeping highways open and safe during winter storms," reports Brown County, Wisc., of this trailer mounted Malsbary 250 HPC (high pressure combination) cleaner. In winter, it removes snow and ice from snow plows, trucks, highway patrol squad cars, and thaws out frozen culverts to prevent road flooding. During summer, it speeds maintenance by going to roadbuilding jobs and cleaning blacktop equipment "every chance we get."

Asphalt and Dirt stuck so stubbornly that servicing—even greasing—first required its removal from the roadbuilding equipment of The White Construction Co., Milwaukee, Wis. This literally had to be done with a shovel.

Now a Malsbary 250 HPC cleaner, mounted on same truck as lube equipment, takes steam cleaning right to the job, "does in minutes what used to take hours." Says Foreman Ellerman,

"Malsbary cleaning certainly speeds greasing and other maintenance."



Tricycle-Mounted Malsbary 250 HPC is easily pulled around large equipment yards and shops, or over uneven ground on field jobs. It speeds service work by taking steam cleaning to the job—no carting big assemblies to the cleaner or trying to squeeze heavy rigs into small cleaning sheds. Brackets for holding coiled hose and steam gun eliminate dragging, enable you to take full advantage of tricycle portability.

Whether you use portable or stationary Malsbary High Pressure Combination cleaners, you're sure of fast cleaning—4 to 10 times faster than most other cleaners, and at $\frac{1}{2}$ to $\frac{1}{5}$ th the cost. For proof call your Malsbary dealer (see yellow pages of phone book) and ask for a demonstration... or write us for literature showing how Malsbary steam cleaning pays off for other successful earth-movers and dealers.



Room 109 845 92nd Ave., Oakland 3, Calif.

More than 175 Authorized Service Centers
in U. S. and Canada.

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**What makes
Hyatts run
smoother
and longer?**

**CARBURIZED
INNER RACES**

From a fatigue life standpoint, the inner race is the critical member of a roller bearing, because the smaller area of contact between rollers and inner race concentrates the loads upon it. That's why HYATT goes to the added expense of carburizing every inner race—to assure you the performance and fitting advantages detailed at the right.

You will find full selection and application data in HYATT Catalog 150, or call your nearest HYATT Sales Engineer. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey. Sales offices at Harrison, Pittsburgh, Detroit, Chicago and Oakland, Cal.



FOR REPLACEMENT BEARINGS,
SEE YOUR HYATT
INDUSTRIAL BEARINGS DISTRIBUTOR

H **HYATT**

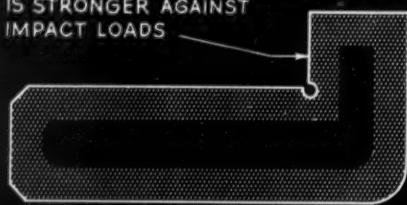
HEAVIER INTERFERENCE FITS

Resistance to relative movement between inner race and shaft is vital to good performance. So HYATT makes practically all inner races of carburizing type nickel alloys instead of through-hardened steel. After carburizing and heat-treating, the outer surface has the hard wear resistance so necessary for an efficient bearing. The low-carbon core remains tough and ductile to permit much heavier interference fits than are otherwise possible.

**TOUGHER FLANGES,
GREATER LOAD CAPACITY**

Carburizing also enables HYATT to obtain substantially tougher inner race flanges. Tests show the shoulders will withstand considerably greater impact loads (Figure 1). The carburizing process has also been found to increase the load-carrying capacity of the race by building up compressive hoop stresses in its external fibres during quenching.

THE SHOULDER OF A CARBURIZED RACE
IS STRONGER AGAINST
IMPACT LOADS



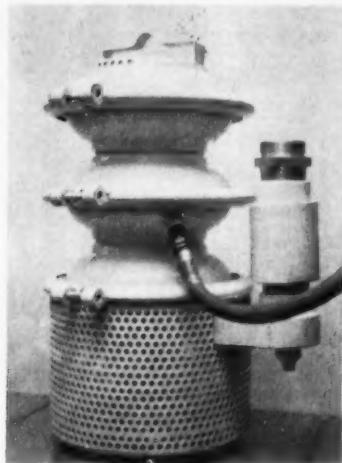
1

SIMPLER, LOWER-COST MOUNTING

Another advantage of HYATT'S heavier interference fits is the elimination of all auxiliary holding devices. When the carburized inner race is either pressed or shrunk on the shaft according to HYATT fitting recommendations, it becomes practically an integral part of the shaft itself. This permits mountings of the simplest type and lowest overall cost.



**HY-ROLL BEARINGS
FOR MODERN INDUSTRY**

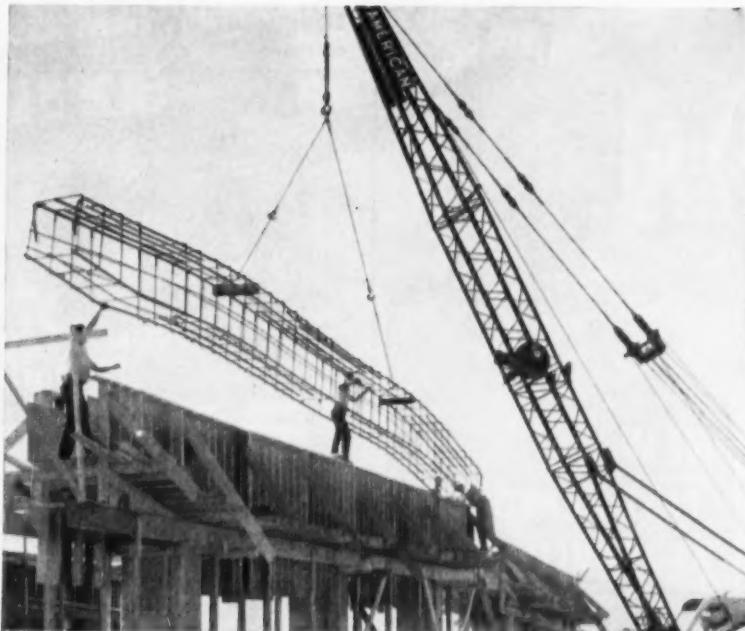


tact any working parts. The pump, which operates on air only, runs quietly and can be used in explosive atmospheres. It is 22-in. high, 12-in. in dia, and weighs only 65 lb.—The Layton Co., Inc., 4749 S. Whitnall Ave., Cudahy, Wis.



SHIELDS—A new line of portable welding shields, designed to confine the welding operation and to protect surrounding personnel from sparks, flash, flying chips, or scale, is offered by Industrial Products Co. The shields, which are self-supporting when set up, are flexible to meet job requirements and they can be rolled up and carried easily when not in use. Made in a wide range of sizes, they are constructed of flame-proofed canvas over a wire mesh frame.—**Industrial Products Co.**, 2715 N. Fourth St., Philadelphia 33, Pa.

VIBRATORY ROLLER—The Vibro-Plus model CH 10 vibratory soil compactor weighs only 1½-ton, yet produces five-ton impacts because of its 2400 vibrations-per-min frequency and its high amplitude. The lower vibration frequencies cut down on wear and

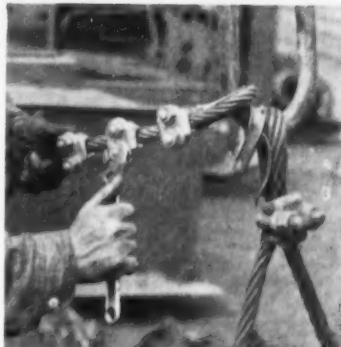


FITTINGS PLAY VITAL PART IN CONSTRUCTION WORK

Fittings simplify materials handling on every job. Here, they play an important role in placing reinforcing steel on a bridge project. Contractors and workers, who stake their lives on their equipment, demand Crosby-Laughlin Fittings. Experience has proved this drop forged line superior in design, manufacture and long life performance!

Safety and materials handling flexibility are achieved by using Crosby-Laughlin Swivel Safety Hoist Hooks on your crane's load line. This drop forged, heat treated hook is designed to give maximum strength without excessive weight. A rugged rust-proof latch mechanism keeps load lines or slings on the hook until they're released. Capacities to 15 tons are available.

Weldless, drop forged, heat treated Crosby-Laughlin Sling Links offer greatest strength and reliability in all lifting assignments. Stock diameters up to 1¾" are offered. Your nearby distributor has catalogs and full technical specifications on the world's most complete line of drop forged fittings for wire rope and chain.



CONTRACTORS DEMAND GENUINE CROSBY "RED U-BOLT" CLIPS

Whenever wire rope must be secured with 100% holding power, genuine Crosby* Wire Rope Clips are first choice of construction men! They're the work-proved symbol of safe, long life performance. For safety's sake ask for, and be sure you get, the original and genuine Crosby Wire Rope Clip that's easily recognized by the Red U-Bolt*. It's the only clip offering a complete range of sizes to fit every rope from $\frac{1}{8}$ to 3" in diameter.

*Registered Trademark

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two-speed action
saves time, money

The new GREENLEE No. 798-AC-SA Hydraulic Power Pump operates GREENLEE pipe benders three to five times faster than a hand pump and increases speed of other hydraulic tools comparably. Exclusive GREENLEE fast approach, with automatic change-over to lower speed high-pressure drive, eliminates costly waiting time, makes numerous jobs go faster and easier. Electric motor-driven pump develops 6,000 psi continuous pressure, up to 10,000 psi intermittent. Same performance available in ac-dc and gasoline motor models.



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Please send illustrated Bulletin E-223 on Greenlee
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COMPANY _____

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CITY AND STATE _____

EQUIPMENT NEWS... continued



tear of the unit, according to the company. The battery and gasoline engine of the unit are protected from vibration through a series of shock absorbers. The highly maneuverable unit can be towed by a small rubber-tired tractor to within 1½-in. of obstructions, according to the company. Twin scraper bars keep the drum clean when the rig is rolled backward or forward.—VIBRO-Plus Products, Inc., Stanhope, N.J.



29-IN. TROWEL—Latest addition to the Master line of power trowels is a 29-in. model weighing only 77 lb. Its features include a push-pull lever on the handle that adjusts blade angle while the trowel is running; a dead-man control that idles the trowel if the operator lets go of the handle; and an automatic clutch that brings the engine to operating speed before the blades are engaged. Power is supplied by a 2.25-hp Briggs & Stratton engine.—Master Vibrator Co., 1752 Stanley Ave., Dayton 1, Ohio.

RUGGED C-CLAMPS—A new line of heavy-duty C-clamps feature a deep-throated body that is drop-forged of heat-treated

WRIGHT SAFEWAYS

Your Best Buy for Rigging
and Maintenance Work



12 Sizes 1/2-ton to 50 tons

Bulletin 412A gives complete details on the many outstanding features that make Wright Safeways your best buy for long, trouble-free life. Write York, Pa. for your copy.

Some Safeway Features

Load Chain is finest alloy, every foot proof-tested...heat treated for hard wear-resistant working surface...ductile to withstand shock loads...“wick” lubricated...anti-rust zinc coat.

Load and Idler Sheaves rotate on life-lubricated, antifriction bearings...minimum of 5 pockets in Big Sheaves for efficiency and long life.

Gears, Pinions, Drive Spindle (also top and bottom Hooks) are nickel-chrome-molybdenum alloy steel mounted on heavy-duty, antifriction bearings. **Gear Train** is enclosed in oil-tight chamber.

Load Brake is Weston type, silent, dependable.

Steel Housing fully protects vulnerable parts.



Wright Hoist Division
AMERICAN CHAIN & CABLE

York, Pa., Bridgeport, Conn.



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is pleased to announce that all the latest F/S models of:

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Austin, Tex.; Hotel S.F. Austin,
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- American Society of Civil Engineers

October 14-18, 1957

New York City, Hotel Statler,
Booth 11/12

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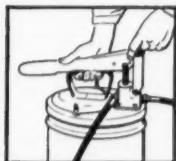
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NOW! A PORTABLE BUCKET PUMP WITH ADJUSTABLE LEVERAGE
SAVES TIME AND MONEY IN LUBRICATION OF HEAVY EQUIPMENT!

NEW ALEMITE "BIG-A" PORTABLE BUCKET PUMP

Lubricates hundreds of bearings
with fewer refillings!

The all-new design and construction features of the new Alemite "Big-A" Bucket Pump bring you these important advantages:

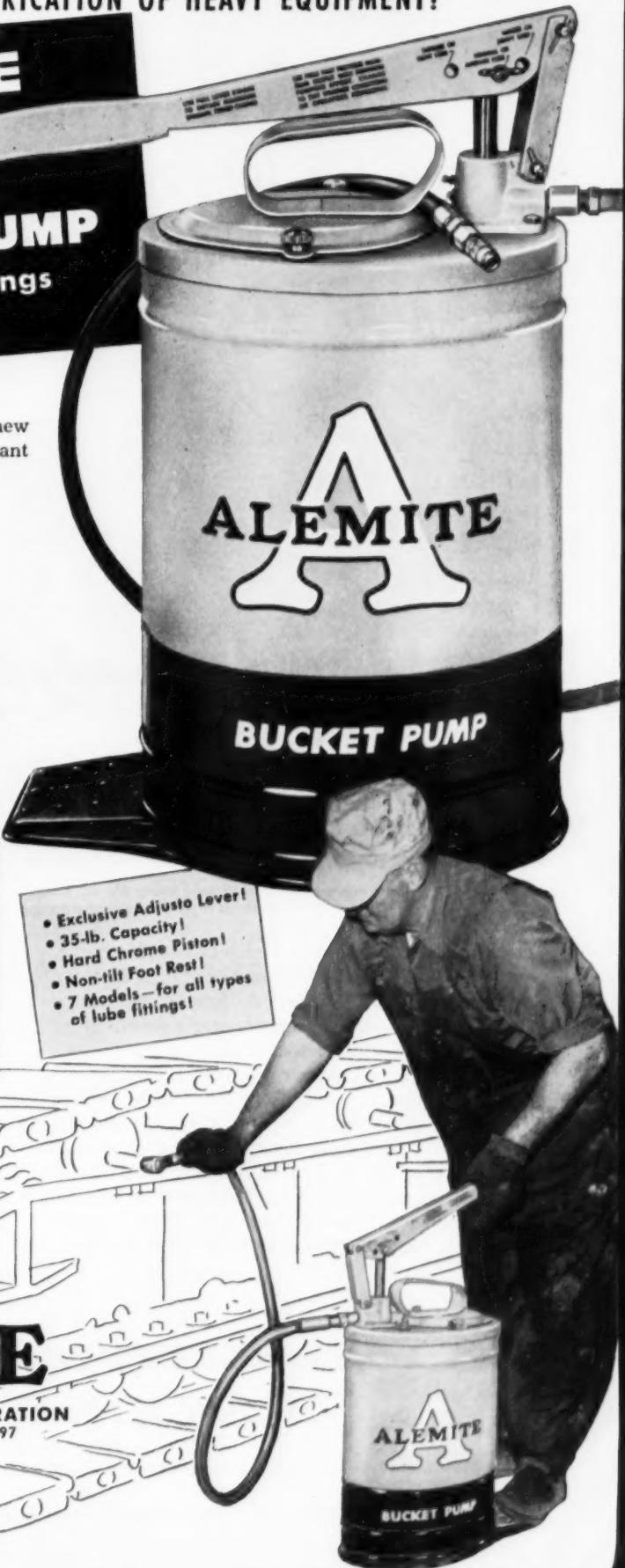


- Handles either oil or grease!
- Adjustable 3 ways, for —
 1. Light or heavy lubricants.
 2. Cold weather.
 3. Pressures from 2,500 to 5,000 lbs.
- Easiest to carry! Oval shape prevents bucket from bumping leg.
- Easiest to fill! Rugged cover is gasket-sealed . . . opens in a jiffy for fast filling.
- Easiest to service! One wrench disassembles entire unit.



SPECIAL ALEMITE "BIG-A" FEATURES!

- Easily handles all lubricants. Ends air pocket trouble and channeling.
- New foot valve design assures full pressure on every stroke.
- Operates at top efficiency, using any lubricant . . . in any weather.
- Lube stays refinery clean. No dirt or moisture entrance, no spilling grease.
- Permanent pressure seal never needs attention. Provides permanent protection.



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Blaw-Knox Heavy Steel Forms save J. A. Jones Construction Company 40% over Wood on Power House Project!



Backwall and counterfort form being placed. Handling time is cut to the bone by special form design.
Form at right is ready for stripping and re-setting at new location.

Down along the banks of McKellar Lake at Memphis, one of the world's largest Steam Generating Stations is under construction. The J. A. Jones Construction Company, builder of the huge concrete substructure is using custom-built Blaw-Knox Heavy Steel Forms on a retaining wall that is 1,684 feet long and 41 feet high. They also are using Blaw-Knox Heavy forms for water intake, circulating and discharge tunnels.

Experience with more than 700 feet of wall shows that re-use of two sets of Blaw-Knox Steel Forms has actually saved 40% over the use of wood. Beyond this too, are the indirect advantages—safety, labor cost, uniformity of construction and salvage.

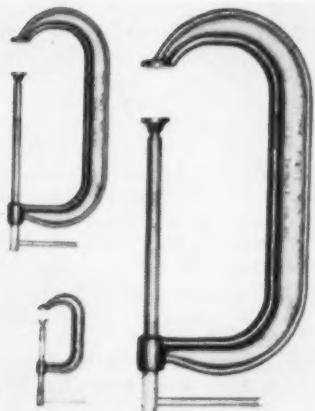
Advantages of custom-built Blaw-Knox Heavy Steel Forms have been proven on many construction projects of world wide interest. Where there is a concreting problem, the speed, flexibility, and salvageability of Blaw-Knox Steel Forms makes them the number one construction tool. They're backed by more than 40 years of experience on wide range of big projects.

Put the Blaw-Knox Steel Forms Consultation Service to work for you, whether your job is a dam, tunnel, sewer, or bridge. You'll get fast, simplified planning, custom-built forms tailored to the exact requirements of your project.

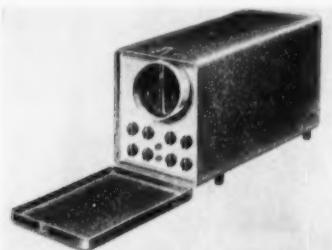


BLAW-KNOX COMPANY

Blaw-Knox Equipment Division
Steel Forms Department, Pittsburgh 38, Pa. • Phone STerling 1-2700



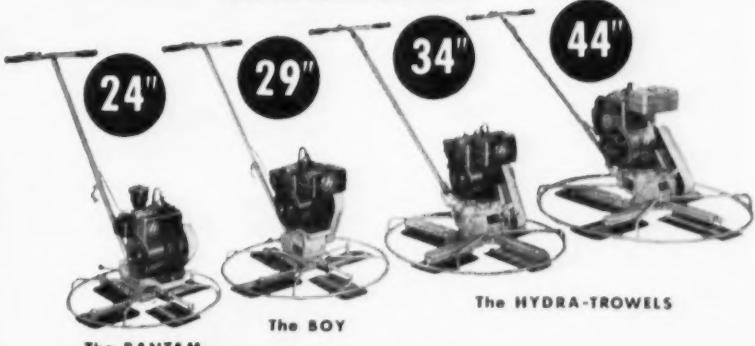
steel. The clamp is designed with an adjustable handle and a floating swivel that facilitate quick adjustments. These parts are copper-plated to resist adhesion of welding spatter. The clamps are available in seven sizes and weights, ranging from 2 to 12 in. —Industrial Clamp Co., 6445 Gratiot, Detroit, Mich.



FINDS TROUBLE — Snap-on's new electronic engine analyzer, called the Anal-O-Scope, provides a visual picture of an engine's complete ignition system. It can be used in the shop to check dwell or cam angle, breaker point operation, distributor wear, condenser action, primary circuit leakage, spark plugs, secondary circuit resistance, secondary circuit insulation, ignition reserve, and valves. The ignition reserve test, an exclusive feature of this analyzer, clearly shows the difference between carburetor and ignition trouble without rod tests. The Anal-O-Scope operates off 110-v current or off a vehicle's battery and does not require an auxiliary power pack. It can be used on 6, 12, or 24-v systems, and it shows the firing cycle of 4, 6, or 8 cylinders all at once or one at a time. The Anal-O-Scope enables the serviceman to test the performance of the entire elec-

Kelley POWER TROWELS

for EVERY Job!



LOOK! ONE HAND!

Low center of gravity makes Kelley trowels stable, easy to operate. No pulling or tugging. No gyrating. You never have to "fight" a Kelley machine.



LOOK! ONE HAND!

Imagine...down a ladder with one hand! That's what you can do with the light, easy-to-carry BOY and BANTAM. So compact you can put it in the trunk of your car.

Here's the BIG, NEW Kelley line, the best power trowels on the market! For the big jobs...two easy-operating HYDRA-TROWELS, 34" and 44", with the exclusive Kelley hydraulic action. A flick of the finger on the control lever sets the 4 dual-purpose blades for floating or finishing any type of floor finish desired. For the smaller jobs...the Kelley BANTAM, 24", and the Kelley BOY, 29". Small for portability and bears for work!

Kelley machines are unmatched for their easy operation. Low center of gravity assures stability, prevents gyrating. All Kelley machines have 4 big, dual-purpose blades for both floating and finishing. Stationary guard ring works right next to walls and makes carrying easy. But above all, Kelley machines put quality, hand-troweled finishes on your floors without back-breaking drudgery.

Kelley	MACHINE DIVISION, Wiesner-Rapp Co., Inc.		
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<input type="checkbox"/> HYDRA-TROWELS	<input type="checkbox"/> BANTAM	<input type="checkbox"/> BOY	
NAME _____			
STREET _____			
CITY _____	ZONE _____	STATE _____	

HERE'S WHERE YOU CAN START SAVING

ON INSURANCE COSTS . . .



Big rock cut near Little Alum Pond on Massachusetts Turnpike. Insurance costs can spell profit or loss on jobs like this.



PUT AJAX TO WORK FOR YOU

High insurance costs can endanger your profits. That makes it imperative to do everything possible to reduce accidents. And the National Safety Council confirms that safety messages which get read offer effective help in accident-prevention programs.

Like the safety messages imprinted free on AJAX Cups, which you can put right in your workers' hands several times a day, at moments when they're relaxed, receptive, ready to read.

Plus the fact that AJAX Cups and Dispensers provide the safest, cleanest, most acceptable way to take fresh drinking water to your men in the field.

Why not get the two-way protection of AJAX complete drinking water service on your next job?

GET THE FULL STORY — Write us today for samples of imprinted AJAX Cups and a new folder giving complete details.



AJAX® CUPS and Drinking Water Tanks deliver fresh water to workers — mean less time lost on the job. 4 oz., 6 oz. and 7 oz. cups, imprinted with assorted stock safety messages at no extra cost — or your own message to order. AJAX Cups and Dispensers are ideal for use with any tanks, barrels or pipeline faucets.



cal circuit while the engine is running. Natural working conditions are taken into account and the effects of compression, temperature and carburetion can be observed. The analyzer employs a cathode-ray tube to obtain a visual trace of the complete ignition cycle. The trace pattern is amplified either horizontally or vertically on the 5-in. tube. The Anal-O-Scope is easily portable and it comes with a power timing light and a full set of spark plug adaptors.—**Snap-on Tools Corp.**, 8028 28th Ave., Kenosha, Wis.



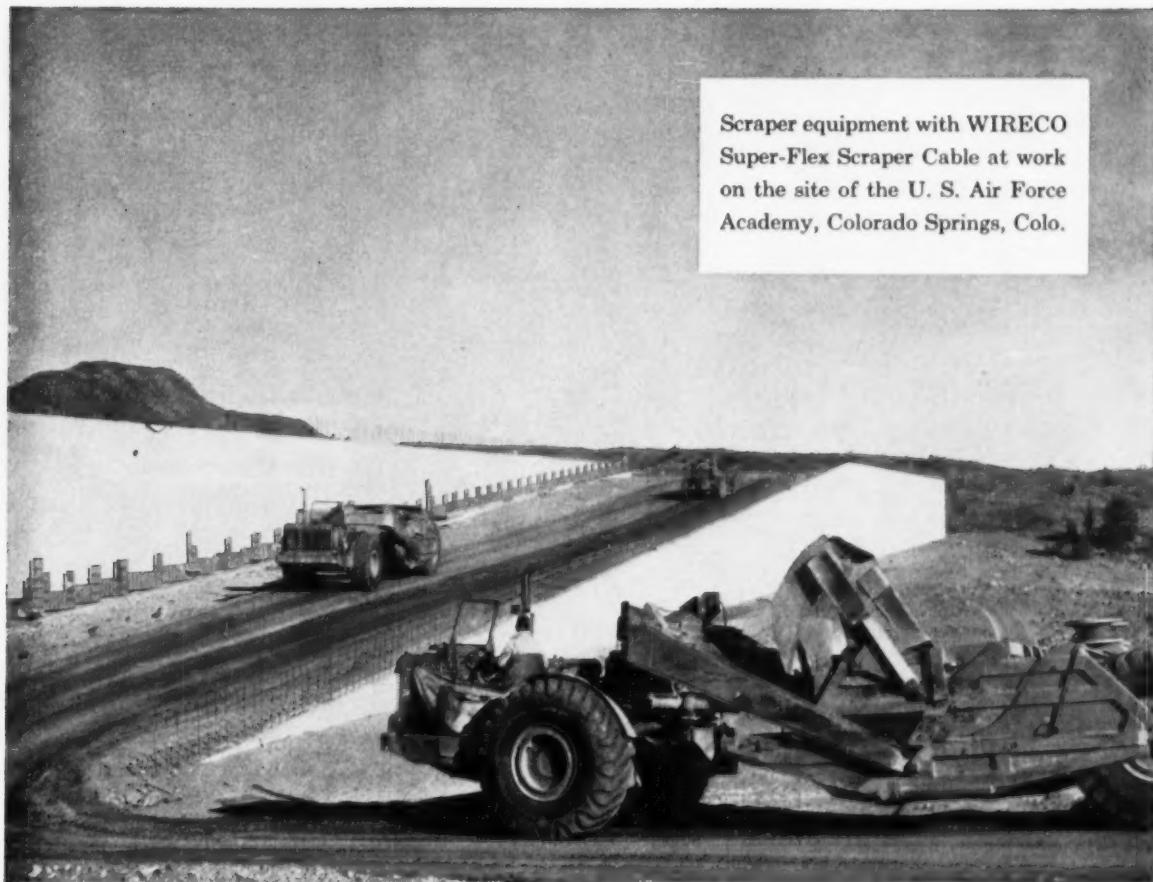
SAFETY LINK—In the last 2-yr. more than 20 men have been killed in California alone in accidents caused by cranes coming in contact with high voltage lines. A new insulated safety link, manufactured by E. D. Bullard Co., protects hook tenders and riggers from such accidents. Crane booms and cable can be energized as much as 50,000 v without danger to men handling the hook or the load. The insulated link in no way affects the capacity of the crane on which it is used, according to the company. The links are available in sizes from $\frac{1}{2}$ to 25 tons. Insulated links in larger sizes have inside cores consisting of two pieces of steel suspended by a phenolic centerpiece. Fiber glass saturated with epoxy resin is wrapped around the core. Smaller sizes are constructed of tough plastic material with steel inserts at each end for attaching the hook.—**E. D. Bullard Co.**, 2680 Bridgeway, Sausalito, Cal.



United States Envelope Company

General Offices: Springfield 2, Massachusetts

15 Divisions from Coast to Coast



Scraper equipment with WIRECO Super-Flex Scraper Cable at work on the site of the U. S. Air Force Academy, Colorado Springs, Colo.

WIRECO Super-Flex Scraper Cable Is the Answer to Longer, Better Service Life!

On the Job Comparison Proved
WIRECO More than 100% Better!

Excavating and grading for the new Air Force Academy was a big undertaking and demanded the finest equipment available. To get maximum performance from the equipment used, several different scraper cables were used to find the one with the longest and best service life. WIRECO Super-Flex Scraper Cable was the answer to this rope problem. This new product proved itself to be more than 100% better than others used. Whatever the problem in the construction field, WIRECO has the answer. Consult your WIRECO Distributor for complete details of this amazing 'est and all wire rope needs.

WIRECO Super-Flex is better because of its
FLEXIBILITY and **ABRASION RESISTANCE**

The special construction of Wireco Super-Flex Scraper Cable combines these two characteristics in a rope that thrives on rough going . . . insures more yardage and greater profit!



**SAFETY
ENGINEERED**

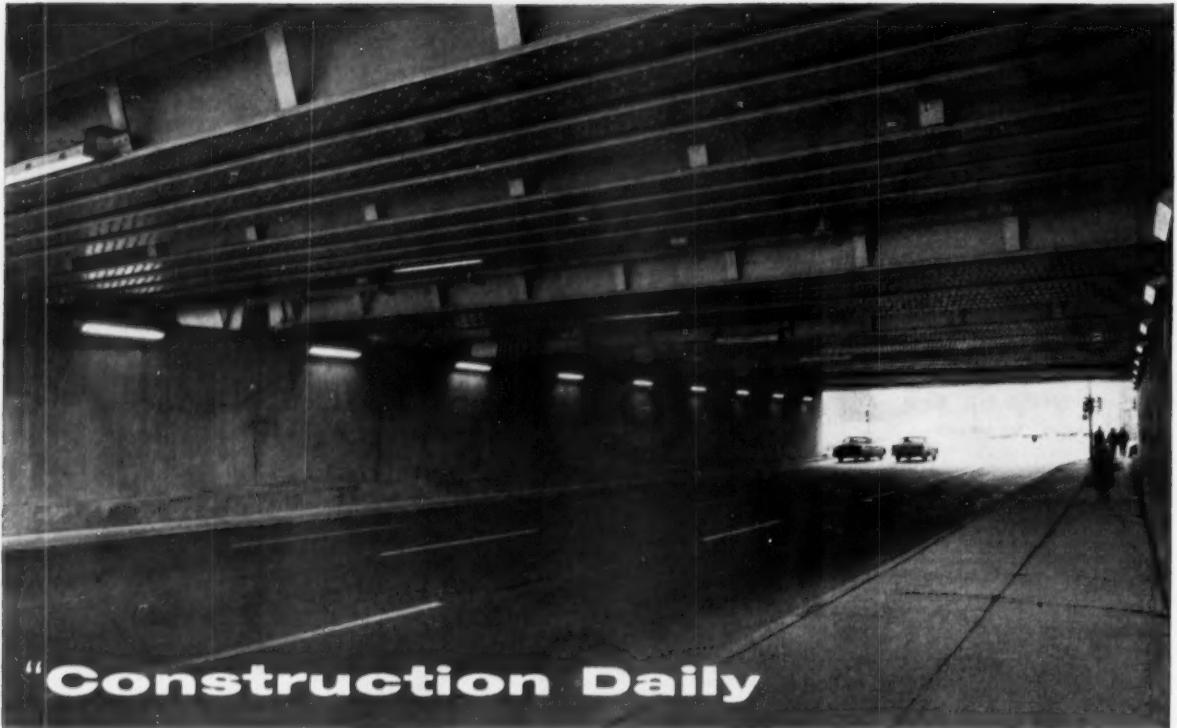
to the demands of your job! Comes wound on scraper reels ready for fast, easy mounting, yet costs no more!

See your WIRECO Distributor TODAY!

**WIRE ROPE
CORPORATION
OF AMERICA**



St. Joseph, Mo. Phone 3-0287



"Construction Daily"

— VITALLY IMPORTANT IN OBTAINING NEW BUSINESS”

Says James McHugh Construction Co.

Reconstruction of Chicago's La Salle Street Station (photo), a job awarded the James McHugh Construction Company, cost \$3,500,000. It's one of their many jobs—in the past few years this general contracting and engineering firm has handled more than \$165,000,000 worth of building and other heavy construction.

Has Construction Daily helped get those contracts? Here's what the company itself has to say:

"Our operations are widespread and diversified and, consequently, we find Construction Daily an invaluable source of information on new projects of interest to us.

"We also find it helpful in keeping abreast of changing price data, material shortages and trends in various fields of construction, all of which are vitally important to us in obtaining new business."

Construction Daily is exactly what it says: a daily report of construction activity. It comes to you in two sections—the Daily Newsletter and Construction Reports. Newly

announced bid dates, proposed new work projects, price information, hot news from Washington and elsewhere are all subjects of the Newsletter.

The Reports section includes bids asked, low bids and contract awards that top \$80,000,000 worth of business a day! It's the fastest, most complete system of reports on building and construction that yield the most business per project in the nation.

Facts you need on every kind of construction arrive daily. They are rushed to you by a large editorial-and-research staff backed by 143 reporters located strategically at all important construction centers around the world. In every case, you get a head start on local, regional, national, even international projects.

A full year's subscription to this daily specialized news service cost only \$175. A Quarterly subscription is available for \$50. Write now for complete details.

About this Company...

Founded in 1900, the James McHugh Construction Company was soon to expand into all types of public and private works. They have completed a variety of multi-million-dollar contracts for schools, public housing, hospitals, industrial buildings, sewage and water treatment plants.

Among these are Chicago's West-Southwest Sewage Treatment Works (\$18.5 million), Dayton's St. Elizabeth Hospital (\$2.3 million), the Tonawanda, N. Y., Water Treatment Plant (\$2.6 million), University of Illinois Residence for Men (\$1.3 million), Cleveland's Lake Shore Housing Project (\$4.7 million), a brewery for Pabst Brewing Co. (\$3.5 million), and many others.

James McHugh Construction Company headquarters are at 6449 South Park Ave., Chicago 37, Ill.

Construction Daily

Dept. CME 102

A McGraw-Hill Publication

330 West 42nd Street, New York 36, N. Y.

SOME BIG CONTRACT AWARDS OF THE MONTH

Turner Construction Co., 150 E. 42 St., New York, N. Y. Prime contractor to manage contract awards for foundations, superstructure, paving, underground service lines, electrical work and masonry, for 1,500,000 sq ft factory office and service bldgs in Columbus, Ohio, for Western Electric Co., 195 Broadway, New York, N. Y. \$50,000,000.

LaSalle Construction Co., 343 So. Dearborn St., Chicago, Ill. and **American Bridge Div., U. S. Steel Corp.**, 208 S. LaSalle St., Chicago, Ill. Steel mill blast furnaces, 135th and Perry Sts., Riverdale, Ill. for Acme Steel Co., 135th St. and Perry St., Riverdale, Ill. \$24,000,000.

Green Construction Co., 321 Locust St., Des Moines, Iowa, and **Tecon Corp.**, 1201 Main St., Dallas, Tex. Dam and outlet works, Hills Creek Reservoir, Lane Co., CIVENG-35-026-57-175, Oregon. U.S. Eng., Pittock Block, Portland, Ore. \$20,572,366.

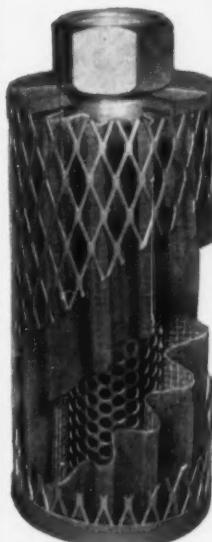
Anthony P. Miller, Inc., 3333 Arctic Ave., Atlantic City, N. J. Armed services housing (Capehart) ENG-18-020-57-26, Fort George G. Meade, Md. for U. S. Eng., 24 St. and Maryland Ave., Baltimore 18, Md. \$16,500,000.

Engineers, Ltd., Pipeline Co., 200 Bush St., San Francisco, Calif. Construct 138-mi $\frac{3}{4}$ -in. pipe looping on its super inch pipe line, will complete looping along full length of natural gas line which stretches 500 mi. from Topcock, Ariz., to San Francisco Bay Area, Arizona and California. Pacific Gas & Electric Co., 245 Market St., San Francisco 6, Calif. \$15,000,000.

Koppers Co., Koppers Bldg., Pittsburgh, Pa. Two batteries of coke ovens at Cleveland Works, Cleveland, Ohio, for Republic Steel Corp., 3175 Independence Ave., Cleveland, Ohio. \$14,000,000.

Cunningham Bros., Inc., 359½ Grand Ave., Beloit, Wis. Contr. No. 7, Mill Creek Sewage Works, Cincinnati, Ohio. City, City Hall, Cincinnati, Ohio. \$6,947,624.

FOR DEPENDABLE PROTECTION on Construction Industry's Hydraulic Equipment

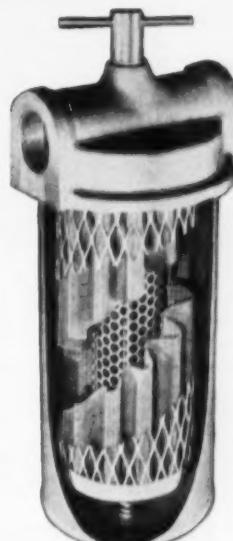


SUMP TYPE
(cutaway)

MARVEL SYNCLINAL FILTERS

Over 750

Original
Equipment
Manufacturers
Install Marvel
Synclinal Filters
as Standard
Equipment.



LINE TYPE
(cutaway)

Hydraulic Oils MUST BE CLEAN
to Protect Equipment—
Increase Production—
Reduce Maintenance

CONSTRUCTION ENGINEERS and MAINTENANCE MEN, whose job it is to keep machinery operating at peak efficiency, are specifying Marvel Synclinal Filters on new equipment and standardizing with Marvels on existing equipment.

It's The ACTIVE Filtering Area That Counts!

The Synclinal design of Marvel Filters provides that all important balance between maximum ACTIVE filtering area and sufficient storage capacity for filtered out particles. Thus, longer periods of productive operation are obtained before filter cleaning is necessary. Marvel Synclinal Filters are easy to clean because both the sump and line type may be disassembled, thoroughly cleaned and reassembled in a matter of minutes. Line type operates in any position and may be serviced without disturbing pipe connections.

A SIZE FOR EVERY NEED

Available for sump or line installation in capacities from 5 to 100 G.P.M. Greater capacities may be attained by multiple installation (as described in catalog). Choice of monel mesh sizes range from coarse 30 to fine 200.

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Marvel's most recent development is a filter for the efficient filtration of all types of fire-resistant hydraulic fluids.

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Both sump and line type filters have been adapted for use in all water filtering applications. No changes have been made in the basic, balanced synclinal design.

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- Catalog #200—For Fire-resistant Hydraulic Fluids (Aqueous Base)
- Catalog #400—For Fire-resistant Hydraulic Fluids (Synthetic)
- Catalog #301—For Water. (CME-8)

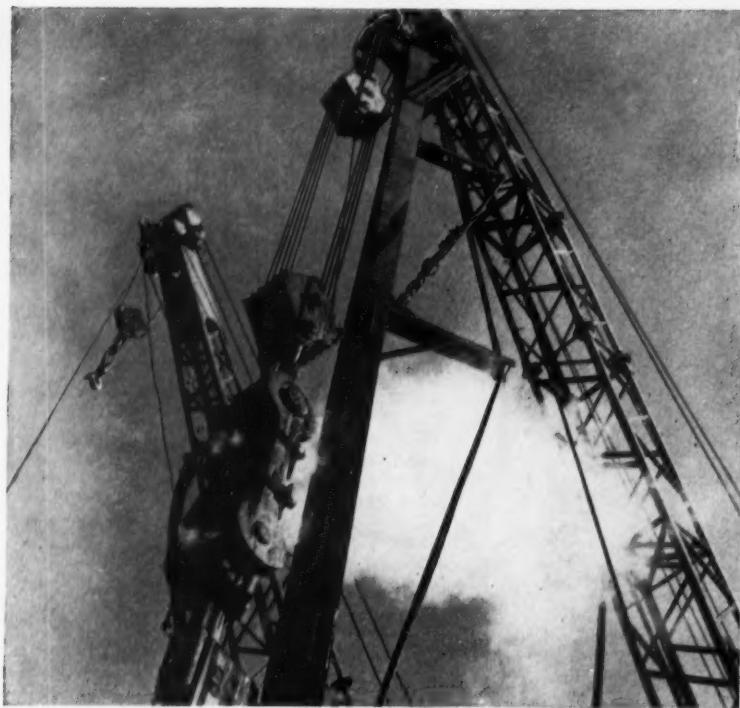
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Withdrawing a pile with a McKiernan-Terry E4 Pile Extractor hung from a steel strongback suspension that exerts downward pressure on the pile next to the one being removed. The cable strongbacks and a cable from the cross-bar to a deadman give the unit additional strength. McKiernan-Terry Corporation, 110A Richards Ave., Dover, N. J.

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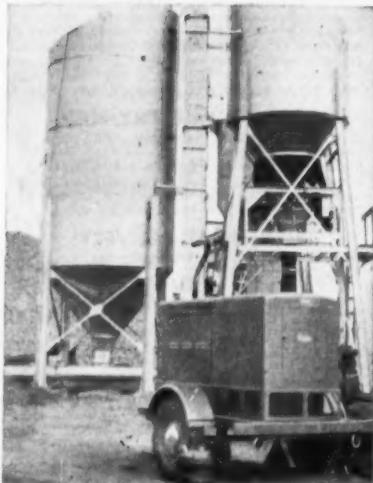
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New Publications

These catalogs and bulletins from manufacturers contain useful information about construction equipment and materials. To obtain a copy, write directly to the manufacturer at the address given.

A-C SCRAPER — Performance and design features of the TS-160 motor scraper, recently added to the Allis-Chalmers line, are featured in a new illustrated catalog. Photographs, drawings, and specifications are included. The TS-160 is a 155-hp unit with a 7-9½-yd capacity.—**Allis-Chalmers Mfg. Co., Milwaukee, Wis.**

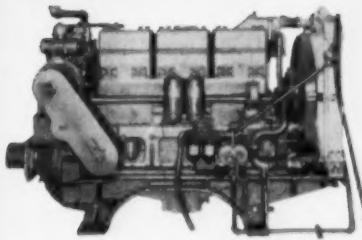
SCAFFOLD HARDWARE — Superior Scaffold Co. has published a new reference catalog containing illustrations and technical data on all the major items in the company's line of scaffold hardware.—**Superior Scaffold Co., 5624 Bankfield Ave., Culver City, Cal.**

LOADER LINE — A new 16-p catalog describes the Tracto-Loader line of front-end loaders. Photos and drawings illustrate design features of the five models currently in the Tractomotive line. Important specifications are also included.—**Tractomotive Corp., Deerfield, Ill.**

LATEST PAYSCRAPER — New features of the International model 55 Payscraper are described in a recently published booklet. The scraper's improved bowl design, its three-piece reversible cutting blade, and its redesigned power steering system are illustrated with photos and drawings.—**International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.**

FRiction FACTS — A new Caterpillar bulletin answers questions about friction material for clutch facings and brake linings. The 8-p bulletin points out the vital characteristics friction material must have to withstand the severe conditions imposed by earthmoving machines. Friction loss, glasing and chipping, wear, and torque capacity are discussed.—**Caterpillar Tractor Co., Peoria, Ill.**

continued on page 273



This Allis-Chalmers 197-hp diesel "matches the needs" for tough excavator service in the Bucyrus-Erie 2½-yd 54-B.

ALLIS-CHALMERS ENGINES MATCH YOUR NEEDS

MATCH YOUR PERFORMANCE STANDARDS — with Allis-Chalmers high-torque, high-usable-horsepower engines that *stay on the job*.

MATCH YOUR POWER REQUIREMENTS — from a wide range of sizes and types, 9 to 516 hp. Specify or install them in *all* your equipment.

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ROCK GRIP WIDE BASE

ROCK GRIP

NEW PUBLICATIONS . . .

continued

FORM LINE—A new 20-p catalog describes the full line of Form-Crete casting forms. Double T, bridge beams, I-beams, pilings and other standard types are illustrated, and a special section shows a number of forms that were designed to meet customer specifications. The bulletin is indexed by form types for easier reference.—Food Machinery and Chemical Corp., Florida Div., P.O. Box 1718, Lakeland, Fla.

PALLET INFO—The American Road Equipment Co. has revised its popular "Why Palletize" booklet. It offers a resume of the savings and advantages available to contractors who use proper palletizing techniques, and it gives information on methods of packaging.—American Road Equipment Co., 4201 N. 26th St., Omaha, Neb.

COST CUTTING TIPS—A 32-p special edition of the Eutectic semi-monthly Technical Information Digest is devoted entirely to construction maintenance operations. More than 90 photos are used to illustrate numerous case histories. Particular emphasis is placed on repairing cast iron, manganese, and carbon steel, and another section describes cost-cutting hardfacing procedures. Fabrication of structural steels and pipe lines is also covered.—Eutectic Welding Alloys Corp., Flushing 58, N. Y.

CONCRETE STANDARDS—The Concrete Institute has published two new books. The 1957 Book of Standards contains 300 pages and covers specifications, testing, and placing of concrete. Price is \$4 per copy. The second book, Manual of Concrete Inspection, contains 240 pages and costs \$3.50 per copy.—American Concrete Institute, P. O. Box 4754, Redford Station, Detroit 19, Mich.

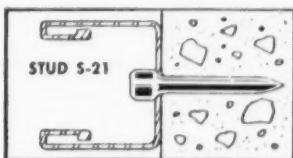
WELDING DATA—The American Welding Society has issued a 24-page set of charts comparing filler metal of various manufacturers. The brand names of 61 companies are classified under 12 AWS-ASTM specifications so that any brand may be quickly identified. An alphabetical listing of brands and another of manu-

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CARCO WINCHES LICK 65° GRADE ON "WILDERNESS ROAD" PIPELINE

Key equipment in building a 36-mile natural gas pipeline from Osborn Gap, Virginia, to Maytown, Kentucky, were 9 Carco-winched-equipped Allis-Chalmers tractors.

Called Wilderness Road, the line was a tough assignment, as solid rock and grades up to 65 degrees were encountered in crossing the mountains of Virginia and eastern Kentucky.

On this job, as on most pipeline projects, Carco winches were found invaluable in helping complete the work on schedule. Some of the important tasks for which the contractor, H. B. Ranier Construction Company of Prestonsburg, Kentucky, depended upon Carco winches were towing costly, heavy equipment such as loaded pipe trucks, ditchers, backhoes and welders up steep grades and holding them on down slopes.

All 9 Carco winches were either Model FO or Model GO. Both are specifically designed for pipeline and oilfield work. Both offer contractors two forward speeds and reverse, automatic brakes, constant mesh gear trains and other features, many exclusive with Carco.

Carco makes more winches for more makes and models of industrial tractors than any other producer. That's conclusive evidence that Carco winches are designed to perform efficiently and built to withstand the rugged service to which they are subjected. For your next winch, be sure to see your nearest Carco dealer. **PACIFIC CAR AND FOUNDRY COMPANY**, Renton, Washington. Branch at Chicago, Illinois.

SPECIFICATIONS

CARCO FO Winch

Cable Drum Sizes:	
Barrel diameter	8"
Flange diameter	19"
Barrel length	15"
Drum Capacity (calculated):	
5/8" wire rope	746'
3/4" wire rope	518'
7/8" wire rope	390'
1" wire rope	292'

Line Pull, Bare Drum:
To 50,000 lbs. depending
on tractor horsepower.
Shipping weight—1,590 lbs.

SPECIFICATIONS

CARCO GO Winch

Cable Drum Sizes:	
Barrel diameter	8"
Flange diameter	22"
Barrel length	13"
Drum Capacity (calculated):	
5/8" wire rope	658'
3/4" wire rope	482'
7/8" wire rope	371'
1" wire rope	293'

Line Pull, Bare Drum:
To 60,000 lbs. depending
on tractor horsepower.
Shipping weight—2,425 lbs.

Carco is a pioneer maker of tractor winches. From the first, Carco winches have been built to give such lasting efficiency they have earned an international reputation for dependability.

CARCO®

NEW PUBLICATIONS . . .

continued

facturers and their addresses also is included. This booklet contains a wealth of information that up to now could be obtained only by referring to the data sheets of each of the 61 manufacturers. Copies cost \$2 each postpaid. Ask for "Filler Metal Comparison Charts . . . AWS A5.0-57." American Welding Society, 33 West 39th St., New York 18, N.Y.

SCRAPER FILM—A 8½-min, 16 mm film entitled "The Low-bowl Story" demonstrates the advantages of a scraper design Caterpillar introduced in 1955. Film may be obtained from local Caterpillar dealers or direct from the company, Advertising Division, Caterpillar Tractor Co., Peoria, Ill.

WIRE CLOTH—The Cambridge Co. has put out a new 94-page catalog of its complete line of industrial wire cloth, screens, and wire cloth products. In addition to types, sizes, and typical applications, the book includes useful metallurgical tables and trade definitions.—The Cambridge Wire Cloth Co., Cambridge, Md.

DRILLING HOLES—This is the title of Stardrill-Keystone Company's 164-page, 75th anniversary catalog. The book describes the company's complete line of drilling equipment and includes information on field applications and procedures.—Mr. H. J. Allen, Stardrill-Keystone Co., Beaver Falls, Penn.

LARGE NUT CATALOG—Acimet has published a four-page catalog of its 1½ in. to 4 in. nuts. Included are specifications, prices, and a brief outline of the manufacturing process.—Dept. P, The Acimet Manufacturing Co., 1550 Rockwell Ave., Cleveland, Ohio.

CONCRETE TIPS—"Hot Weather Concreting" is the third in the series, "Craftsmanship in Concrete," published by the Alpha Portland Cement Co. The first two folders covered steel trowel finishing and winter concreting. The company plans to continue the series.—Alpha Portland Cement Co., 15 South Third St., Easton, Pa.

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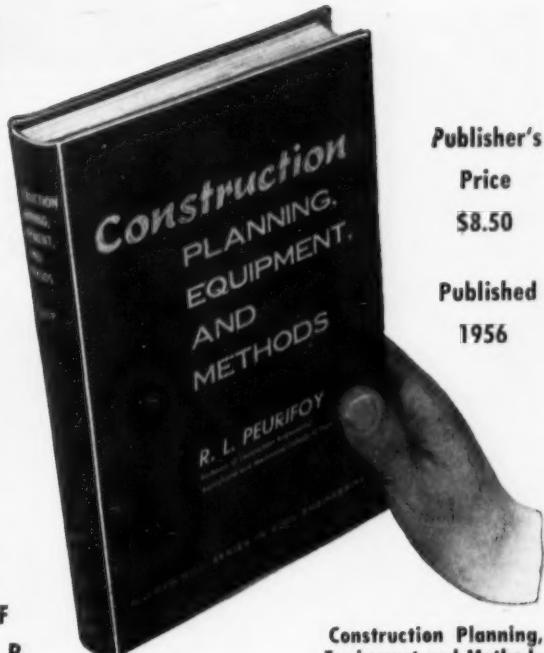
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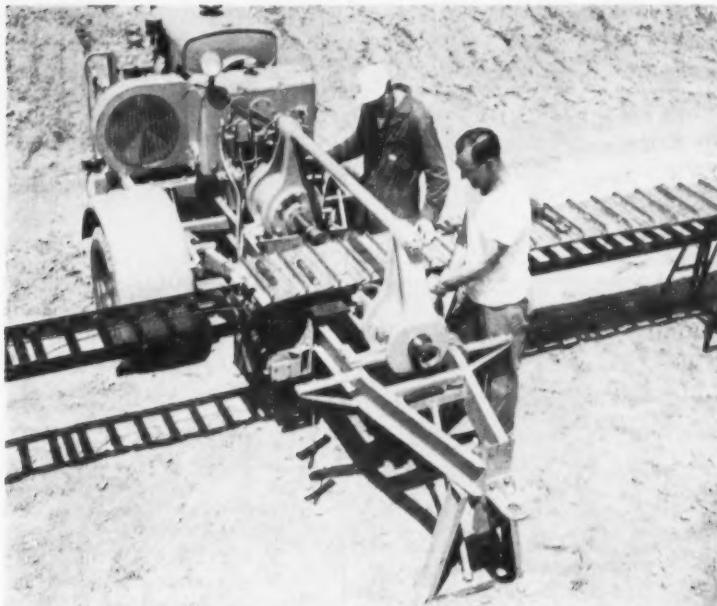
Thirteen leading manufacturers are ready to bring you all these advantages by fabricating dump bodies of Alcoa Aluminum to your specifications, or by supplying economical standard designs. For more information on dump bodies and the name of the manufacturer nearest you, write Aluminum Company of America, 1879-J Alcoa Building, Pittsburgh 19, Pa.

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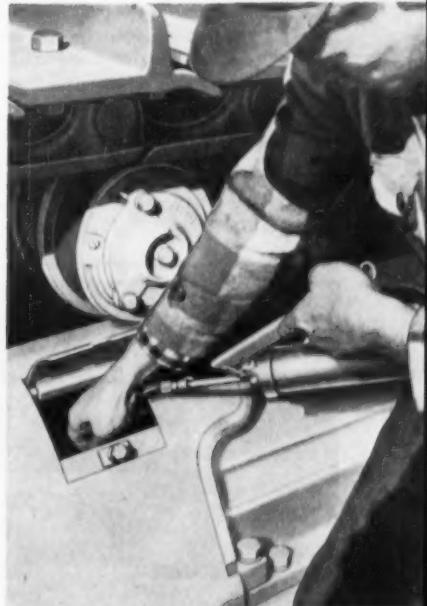


Your Guide
to the Best in
Aluminum Value

The Maintenance Shop . . .



SERVICEMEN turn pins and bushings in the field with the help of a portable Rogers track press. This procedure doubles the life expectancy of these components.



A FEW SHOTS with a grease gun adjusts tracks hydraulically, minimizes wear.

Attention to Details Cuts Track Wear

A CRAWLER TRACTOR'S endless track chain should be a significant symbol to servicemen because the components making up the track group are so interrelated that factors affecting the life of one component also affect the lives of other parts of the assembly.

It is the tractor's undercarriage that has earned for the crawler its title as the work horse of the industry. Because the track assembly is called upon to perform so many tough and varied jobs, it deserves the best possible care.

J. B. Sinclair, of the Caterpillar Tractor Co.'s service department, points out that three factors determine the over-all efficiency and life cycle of the track group. These are the jobs the tractor performs, the way the operator handles the machine, and the way it is maintained.

According to Sinclair, the fac-

tor that must be considered first is the job the tractor is asked to perform. The tractor that is not properly equipped cannot be expected to perform the jobs assigned to it to the full extent of its capabilities. The tractor that comes from the factory is usually equipped to handle average working conditions; if it is to be worked steadily under abnormal conditions, it should be fitted with special equipment that will enable it to do its job properly without excessive wear.

For a tractor that is working in rock, one of the most useful items of special equipment is the track roller guard group. These guards, which are designed to keep rock from feeding in between the rollers and the track—where they are crushed by moving parts—will pay for themselves over and over again, according to Sinclair. They reduce abrasive wear and pre-

vent excessively tight tracks that tend to stretch out and cause breakage.

Guards also assist in holding the track on the rollers when the tractor is traveling over rugged or steeply sloped terrain, thereby reducing wear on roller flanges and idler pilot arms. Guards are not just gadgets; they are essential for economical operation in rock.

The same can be said for narrow track shoes. Wider shoes have a greater over-hang beyond the track link than narrow shoes, and loads applied to the outer edges of wide shoes have more leverage that can cause damage in rock.

Snow, mud, and some types of wet sand have a tendency to pack and take up the slack in the tracks, thus causing serious damage. There are special shoes with cut-out sections between the bolt holes and sprockets with deeper than normal recesses between the teeth that will cut wear.

True, most tractors work under several conditions in a short period of time, and major track components cannot be changed every day to match changing applications. But an analysis of the

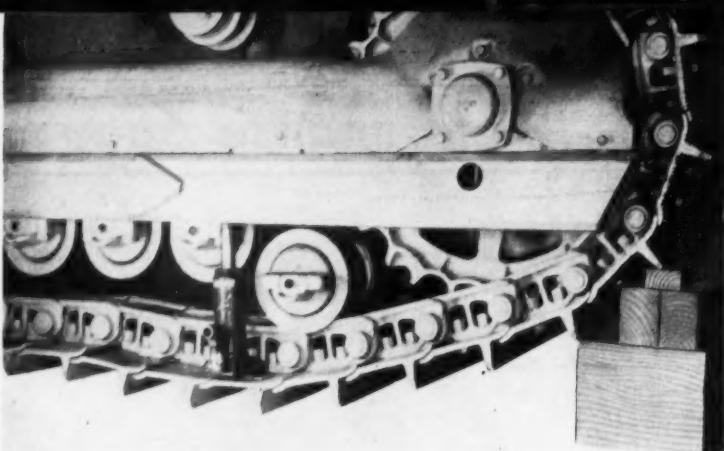
MAINTENANCE SHOP ...

continued

proposed applications of a tractor will enable the owner to choose auxiliary equipment that will most nearly meet his needs. Such a middle-of-the-road analysis can cut downtime and repair costs appreciably.

Service Tips

Just as the best defense is a good offense, so the best maintenance program is a preventive



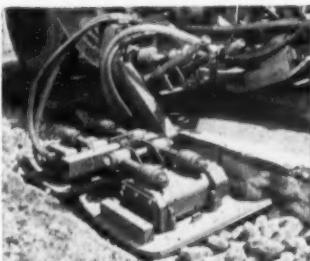
WITH TRACTOR up on blocks, jack is used to free forward rollers. These are moved to rear of the frame to distribute wear evenly.



Cut your high-density compaction costs with the LIMA ROADPACKER

Macadam Bases—Coarse aggregate for bases up to 12 in. thick can be spread in a single layer, then uniformly compacted to final density by the Roadpacker over a 13 ft., 1 in. width. This single course construction, possible only with vibrators, reduces spreading time by half. Also it eliminates the need for backtracking all the equipment for the second pass; and contour shaping is done once—instead of twice. In waterbound work, the Roadpacker's tamping and vibrating action runs in screenings solid from top to bottom. Only three spreads of screenings are required, and much of the hand labor of spreading, brooming and rolling is eliminated.

Gravel Subbases and Soil Cement Bases—Specified density is obtained in one to three passes, depending on material and depth. Because the Roadpacker compacts equally well traveling forward or in reverse, there's no deadheading when two or more passes are needed. Vertical packing action prevents troublesome shoving on difficult materials and does not drift the spread down on super-elevations.



Widener Attachment—Vibrating shoes compact material in widening trench while Roadpacker runs on existing pavement. Easily adjusted for various width trenches.

ROADPACKER FEATURES

- **Low maintenance**—Rugged vibrator shoes are pressure lubricated and actuated hydraulically through a completely sealed system. There are no exposed moving parts, no oil levels to check, no breather holes through which oil can escape.
- **Fast and maneuverable**—Highway speeds up to 28 mph, reverse speeds up to 7

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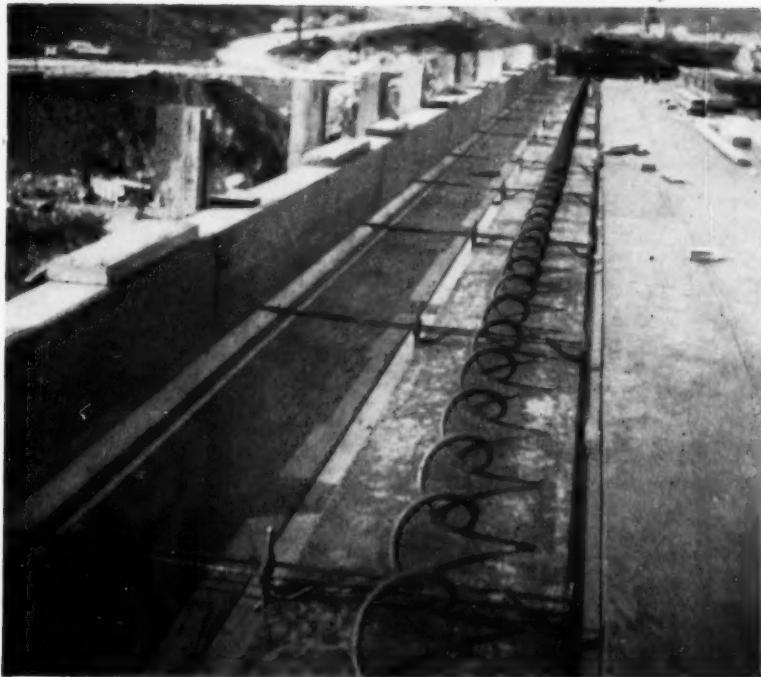
one. Sinclair points out that frequent track adjustment plays a big part in prolonging the service life of track assemblies.

A keen eye must be kept on track adjustment, especially when working in mud or sand, because materials pack in the track and subject the track components and final drive assemblies to abnormal stresses. In addition, a tight track causes serious heating of pins and bushings. They can become sufficiently hot in a short time to temper the original heat treatment, and this can result in a loss of hardness that leads to rapid wear and the need for early replacement.

If tracks are allowed to run too loose, they sag between the points of support and cause additional movement and wear between the contact surfaces of pins and bushings. When a tractor with too loose a track adjustment is driven at high speeds there is a slapping action that causes damage to the track carrier rollers and their bearings and supports.

Tracks that are adjusted by hand with a wrench are rarely adjusted too tightly. But tractors with hydraulic track tension adjustments can easily be overtightened if the mechanic is not careful. All that is required is a few shots from a lever-type grease gun and the hydraulic pressure will take up the track tension. A few shots too many and the track will be too tight.

Many tractors are equipped with front idlers that can be placed in either the high or low position. For most applications the idlers are in the high position, but when the tractor carries heavy front-end equipment it may be necessary to adjust the



Support of these slab forms was quickly and easily accomplished from above with the Richmond Free Fit Hanger Frame-Ty. (Bridge above Ardsley over Saw Mill River Parkway—part of New York State Thruway construction; Raylin Construction Corp. and The Lynn Corporation, general contractors.)

Study of Slab Form Support Shows Savings with Richmond System

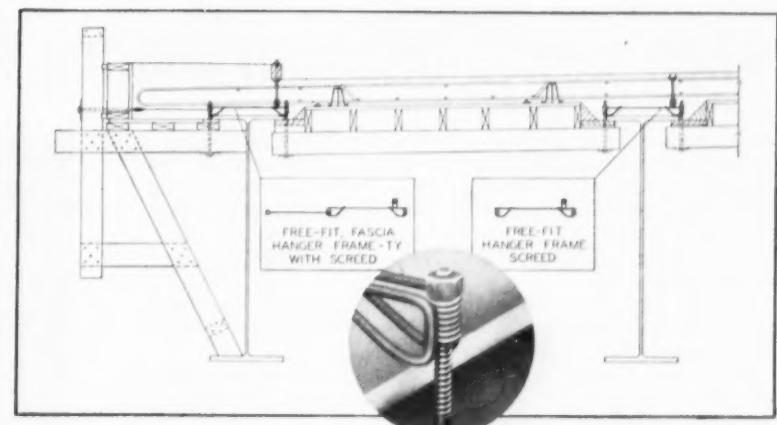
By what standards do contractors measure the effectiveness of flat slab form support methods? Which support systems are proving most helpful?

A survey brought out the following facts: *experienced contractors measure the effectiveness of flat slab form support systems in terms of three things: the degree of speed, safety and economy which they bring to a job.*

Loose wire is no longer used extensively because it meets none of the above three requirements. The use of wire beam saddles also is becoming less common. Although prefabricated to size, they are non-adjustable, and there is no positive means of tightening against the steel to prevent leakage of concrete.

Posting or "horses" are still used but this method is comparable to bracing wall forms. Prefabrication costs are high and erection is slow because of wedging and nailing usually required at the bottom flange of the beam. On high structures and deep beams this procedure is dangerous because the men have to reach down to the bottom flange to make the final tightening adjustment.

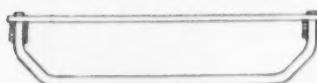
Richmond Hanger Frame-Tys are ideally suited to hang this type of



construction. These units in Standard, Free Fit or Offset types (see illustrations) can all be adjusted for various slab heights and haunch conditions. Their established safe working loads enable the contractor to take full advantage of lumber strength and hanger capacity.

Richmond Standard and Offset Hanger Frame-Tys can be erected with a minimum of reaching under the top flange of the beams. Richmond Free Fit Hanger Frame-Tys have an

additional advantage: all tightening is done from the top of the hanger by means of the nuts (see circle in large illustration), the Tylag passing freely thru an oversized coil.



Dual uses of these Richmond Hangers have become standard: Fascia Hanger Frame-Tys used not only to hang the forms but also tie in the Fascia Ty; a variation of this is the 45° Fascia Hanger Frame for light overhang, where one 45° bolt supports the fascia overhang and hangs the form; Hanger Frame Screeds combine support of the deck forms with an adjustable base for screeding or supporting curb forms.

Richmond Hanger Systems have reduced the contractor's overhead in time and materials, added safety to his operation and improved the quality of his work. The various types of Richmond Hanger Systems and their applications are detailed in the NEW

RICHMOND CATALOGUE. Write for your copy. Or, if you have specific concreting problems, Richmond's Technical Division or field men will be glad to advise you. Write: RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Ave., Brooklyn 8, N.Y. or 315 S. 4th St., St. Joseph, Mo.





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when new aluminum coating holds up so well

On galvanized structures, the rusting caused by atmospheric corrosion usually begins with the bolts and nuts. In time, this presents a serious maintenance problem. But now, at slight extra cost, you can obtain coated fasteners which are so rust-resistant that they outlast any other part of a galvanized structure. These fasteners are coated with Bethalume, Bethlehem's new aluminum coating.

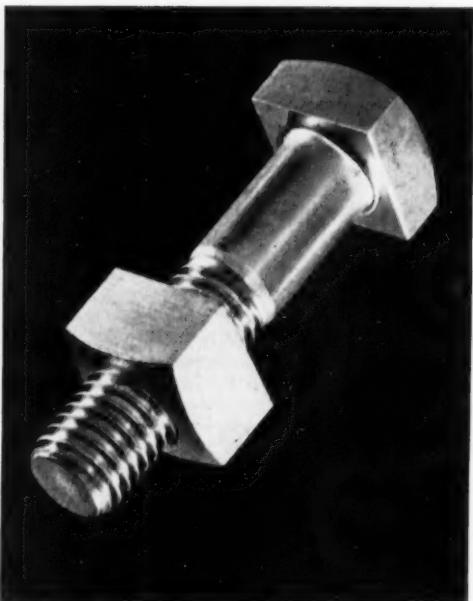
The Bethalume hot-dip coating makes possible a much longer service life for fasteners by adding the corrosion resistance of aluminum to the strength of steel.

Bethalume coatings stand up especially well under "heat-corrosion," at lower cost than products customarily used. Moreover, the Bethalume coating is unusually uniform—not merely on the body of each bolt, but over the entire threaded portion as well, thus making possible threads which are clean and smooth-fitting.

We have a new illustrated booklet on the Bethalume coating, which describes its advantages in detail. If you would like to have a copy, just drop a line to the Bethlehem office nearest you.

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LIKE CAR TIRES, sprockets can be switched to equalize wear. Above, serviceman uses hydraulic puller to release sprocket.

MAINTENANCE SHOP ...

continued

idlers to the low position to obtain better balance.

In the low position the track shoe grousers are subjected to considerably more wear because there is a scrubbing action on each grouser as it passes under the idler. Therefore, when heavy front-end equipment is removed from the crawler, it pays to take the additional time to adjust the idlers from the low to the high position. In the high position, the grouser is more nearly in a vertical position when it comes in contact with the ground, and the scrubbing action is virtually eliminated.

Another major factor in the over-all track group maintenance program is proper lubrication. There is one cardinal rule to remember—follow the manufacturer's recommendations. Because the manufacturer's recommendations are based on years of research and field testing under all conditions, it is folly to ignore them. If the tractor is to be used under abnormal conditions, seek the advice of the local distributor.

Sinclair points out that extreme care must be taken when applying lubricants. When a hand-operated volume compressor is used to grease roller and idler bearings, apply only enough to cause a slight resistance on the compressor handle. Further pumping after a slight resistance is felt will create enough hydraulic pressure to damage seals. Incidentally, when it is impossible to build up this slight pressure on the handle, the chances are a

seal has been damaged. It should be replaced as soon as possible.

When using a power-operated pressure lubricant dispenser, see that the dispenser is equipped with a relief valve in the lubricant line. Otherwise the dispenser can build up enough volume and pressure to injure the seals. Be sure to see that the relief valve has the proper initial setting and check it often. Many times rollers have gone without lubricant because the valve was unseating at too low a pressure.

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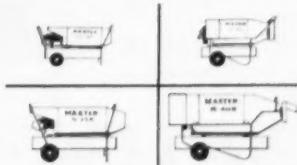
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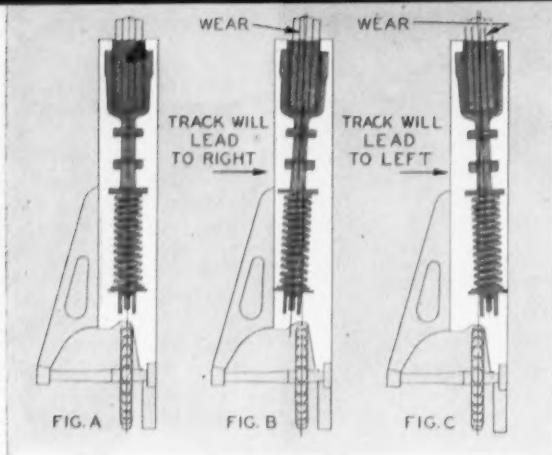


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MAINTENANCE SHOP . . .

continued

IDLER MISALIGNMENT with roller frame causes wear on the pilot rim of the idler as well as on the sides of the track links and the roller flanges. When caught in time, it is easy to correct misalignment and head off extensive damage.

Look for Minor Trouble

Regular inspections will reveal minor trouble before a component is completely ruined. For example, if an idler is misaligned with the track roller frame, it will be evident when the track links or idlers are inspected. A misaligned idler causes wear on the pilot rim section of the idler and on the sides of the track links and roller flanges. When caught in time, it is a relatively simple matter to adjust idler alignment.

In the same way, inspection is the key to the conservation and reconditioning of track parts. The life of sprockets, idlers, rollers, track shoes, pins and bushings is not destroyed by normal wear. Many times the turning of pins and bushings is not only sound, but economically profitable.

As pins and bushings wear, the track becomes longer and adjustment is necessary. When the limit of track adjustment is reached, it is time to turn (rotate 180 deg) pins and bushings for reuse. In most cases, this procedure will double the life of these components. (Do not use the master pin and bushing to judge wear on all the others. The master pin and bushing wears more rapidly because there is less contact area between this pin and bushing than there is between the others. Pin and bushings nearest to the master assembly tend to show more wear than those farther away. Experience shows that periodic replacement for the master pin reduces wear on the others.)

Because all track rollers under a tractor do not wear at the same rate, it is a good idea to switch rollers just as it is a good idea to switch tires on an automobile. This distributes wear evenly and extends the life of the roller group as a whole. Rollers should be changed over at approximate-

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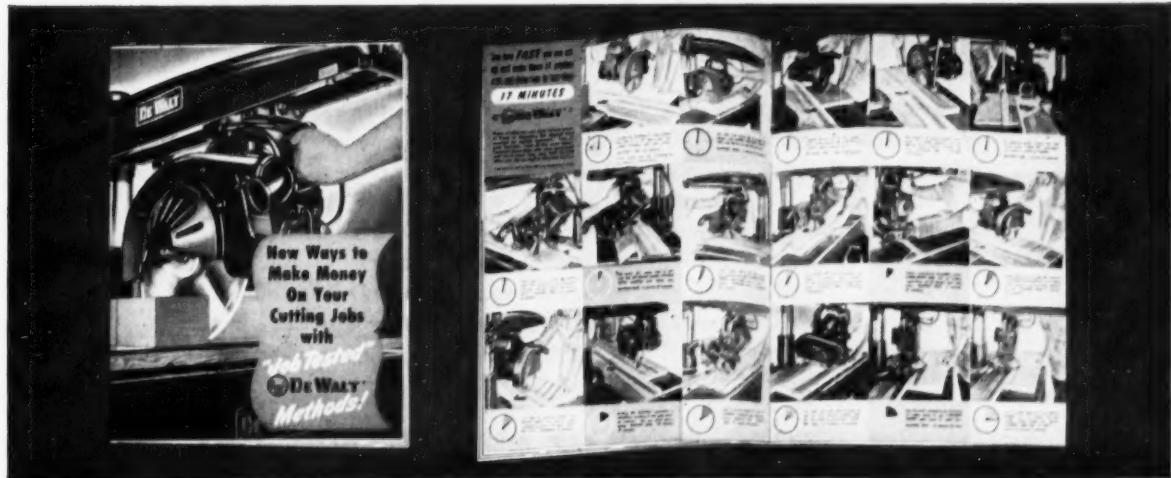
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MAINTENANCE SHOP ...

continued

ly midway in their expected service life.

This usually is done by removing the forward and double single flange rollers and, after moving the remaining rollers forward, reinstalling them at the rear of the frame. Be sure that the positions of double and single flange rollers remain the same on the track frame. Sprockets, too, should be switched if inspection indicates that the teeth are wearing unevenly.

Operator's Responsibility

Sinclair points out that no one is in a better position to ward off serious trouble in the track group than the tractor operator. At the very least, it is his responsibility to recognize conditions that require the immediate attention of a serviceman.

The operator is in the best position to keep a sharp eye on track adjustment as he performs his job. He can also see to it that the rollers are rotating freely. Especially in mud, clay, or gumbo, material sometimes socks around the rollers. When this happens one or more rollers are unable to rotate freely, and the track links slide over the roller surface, causing rapid wear to the roller and the track rail surfaces.

It doesn't take the operator long to drive the tractor on to dry ground and run forward or backward to work off excessive material. If a water supply or even a spade is handy, a little time spent in clearing the track assembly will be a good investment.

The operator also should remember that the track rollers are designed to distribute the weight of the tractor over a large ground area. Reasonable operating habits permit each roller to carry its share of the weight, but rough, slam-bang, cowboy tactics over rocky ground bang the impact load vigorously from one track roller to another. This is not only one of the quickest ways to shorten roller life—particularly that of the front roller—but it is also one of the best ways to shorten the lives of idler bearings and most other track components.

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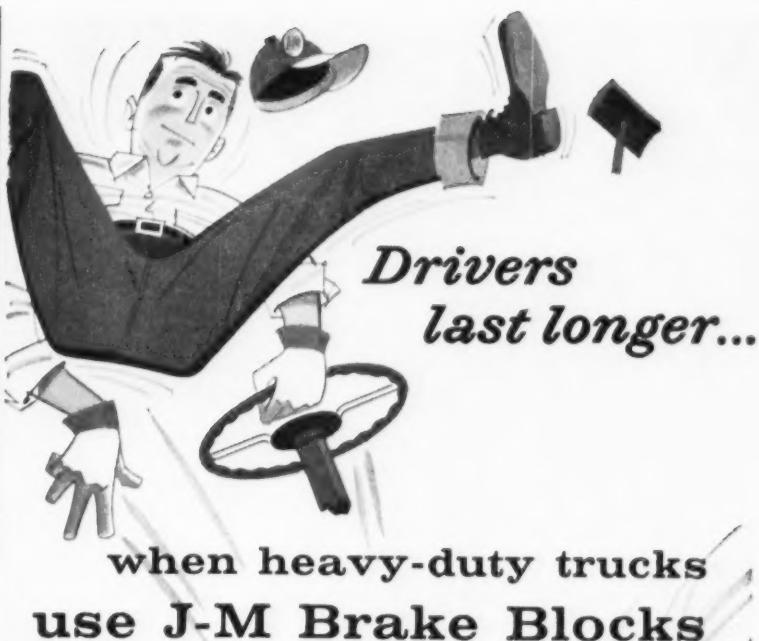
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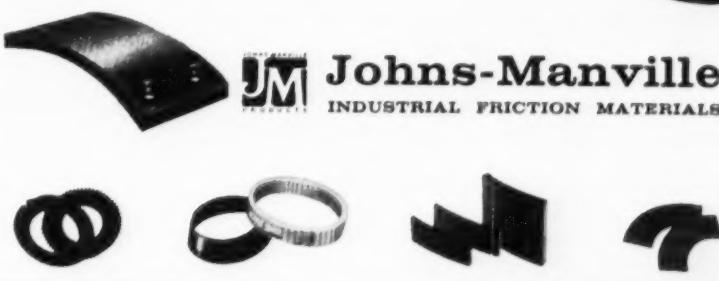
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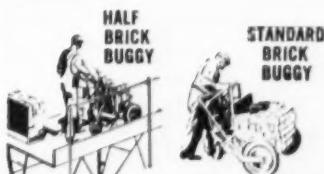
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Fall '57

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F. J. Eberle, Business Manager

Equipment (Used or Surplus New) For Sale	290
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Construction Methods AND EQUIPMENT

830 West 42nd St., New York 36—LO 4-3000



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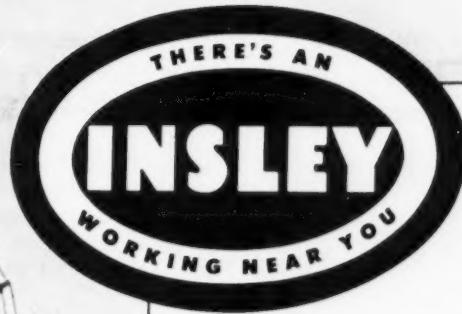
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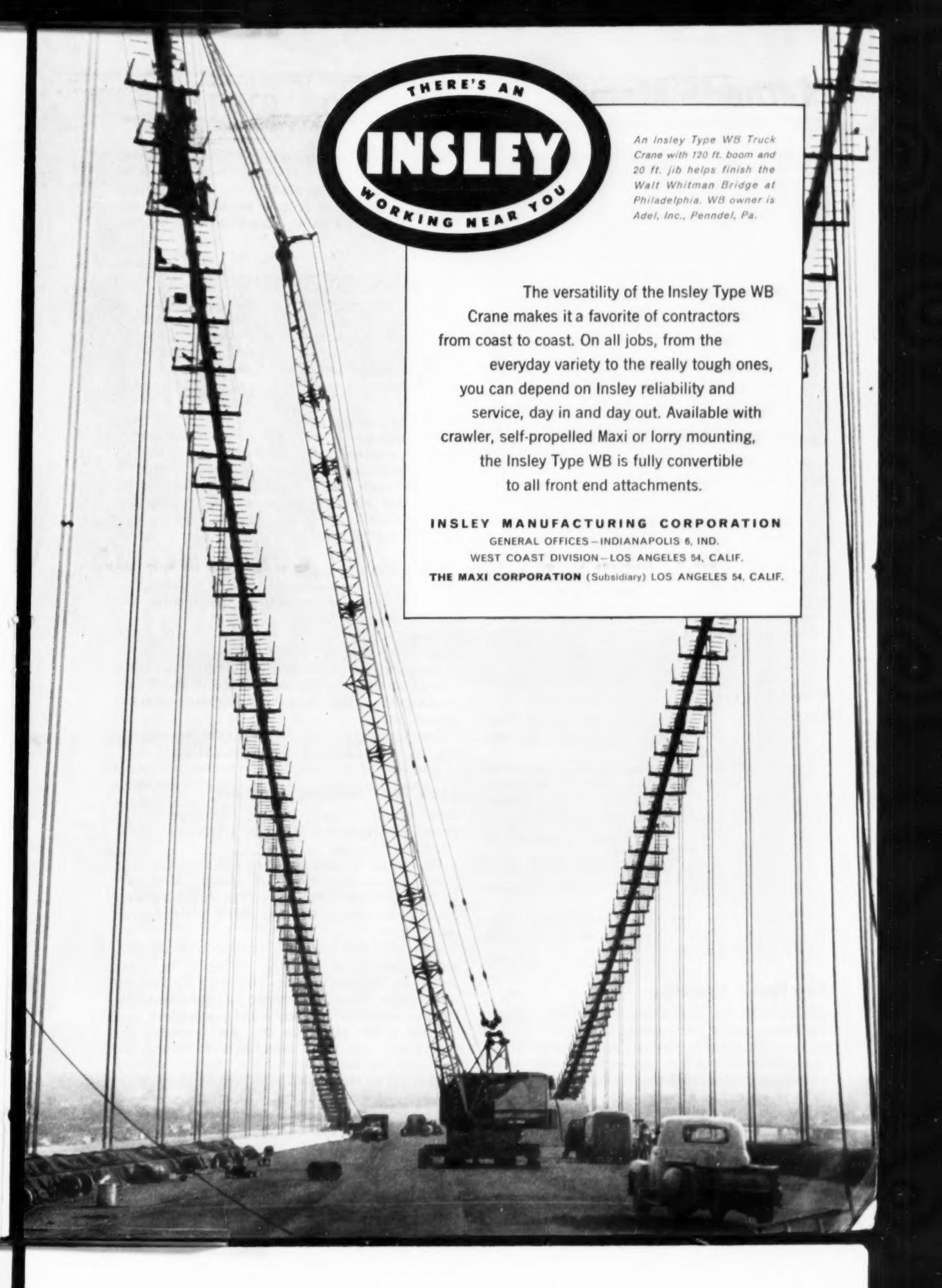
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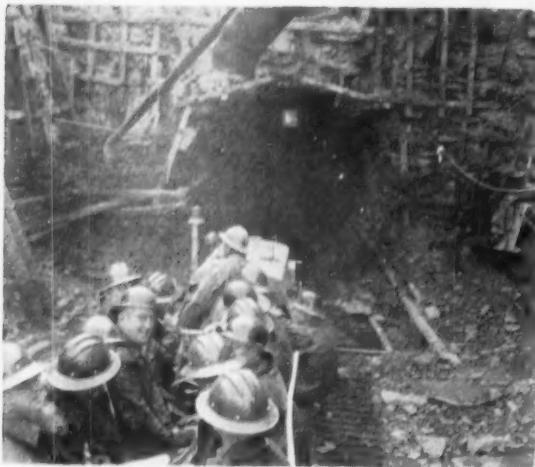
An Insley Type WB Truck Crane with 120 ft. boom and 20 ft. jib helps finish the Walt Whitman Bridge at Philadelphia. WB owner is Adel, Inc., Penndel, Pa.

The versatility of the Insley Type WB Crane makes it a favorite of contractors from coast to coast. On all jobs, from the everyday variety to the really tough ones, you can depend on Insley reliability and service, day in and day out. Available with crawler, self-propelled Maxi or lorry mounting, the Insley Type WB is fully convertible to all front end attachments.

INSLEY MANUFACTURING CORPORATION
GENERAL OFFICES—INDIANAPOLIS 6, IND.
WEST COAST DIVISION—LOS ANGELES 54, CALIF.
THE MAXI CORPORATION (Subsidiary) LOS ANGELES 54, CALIF.



Methods Memo...



Executives Take A Look

Brass hats of the joint venture firm driving New York's West Delaware Tunnel (CM&E, May, 1957, p. 182) donned hard hats last month for a look at the scene of the project's first holing-through.

Along with top engineers of the New York City Board of Water Supply, executives of Drake-Grafe-Winston-Tecon-Conduit climbed into mine cars and rode to the point where their men completed the 13 mi of continuous tunnel. The last 9 mi was driven in the record time of seven months.

Good Citizens

Contractors and their employees in the San Francisco area can be proud of the contribution they made to their Community Fund.

For the five days, beginning Monday, August 19, building trades workers throughout the Bay area worked an extra hour each day at their regular jobs. They drew straight-time pay for the extra five hours and contributed the full amount after standard deductions, to the Community Fund.

Employers donated 50% of the straight-time wages earned by each of their employees during the five extra hours.

The plan was worked out and administered jointly by contractor organizations and the San Francisco Building Trades Council.

Top Speed Tunnelling

Tunnel crews working two shifts daily at the Chutes-Passes power development in northern Quebec are pushing ahead at the rate of almost 200 ft. per week at each of the four headings. One crew posted a record advance of 222 ft in a single week.

The 6-mi tunnel is part of a hydroelectric power project for the Aluminum Co. of Canada. First power is scheduled for August 1, 1959.

The tunnel is 35 ft in dia. Perini-McNamara-

Quemont, joint venture contractor on the job, has a total work force of 1,580 men. They are driving the tunnel by the top heading and bench method with 21-drill jumbos at each heading. Trucks are removing 6,500 cu yd of muck from each heading per week.

Competitor For The Diesel

A new type of engine, suitable for all types of construction equipment, may give the sturdy diesel a lot of competition in just a year or two.

It's called the free piston engine, and it produces pneumatic power instead of transmitting mechanical power through a crankshaft as diesel and gasoline engines do.

The free piston engine has two basic units—a gasifier and a turbine. Power output of the gasifier is a hot compressed gas that is converted into shaft power by the turbine to provide easily controlled variable speed, high starting torque, and direct reversibility of shaft rotation without torque converters, clutches, or gears. Several gasifiers may feed one turbine to provide a wide range of power outputs.

The free piston engine is adaptable to burning a wide range of fuels efficiently, and its weight is less than that of a diesel or gasoline engine with comparable power output.

Hamilton Division of Baldwin-Lima-Hamilton Corp. has two types of free piston engines under development—a single-stage compression unit and a two-stage, turbocharged design. The company says it can produce the single-stage engine in quantity at any time.

General Motors, Chrysler, and Ford, among others, also are developing free piston engines.

Look For "Building America"

Construction industry will tell its story to the American people this fall with a television show, "Building America."

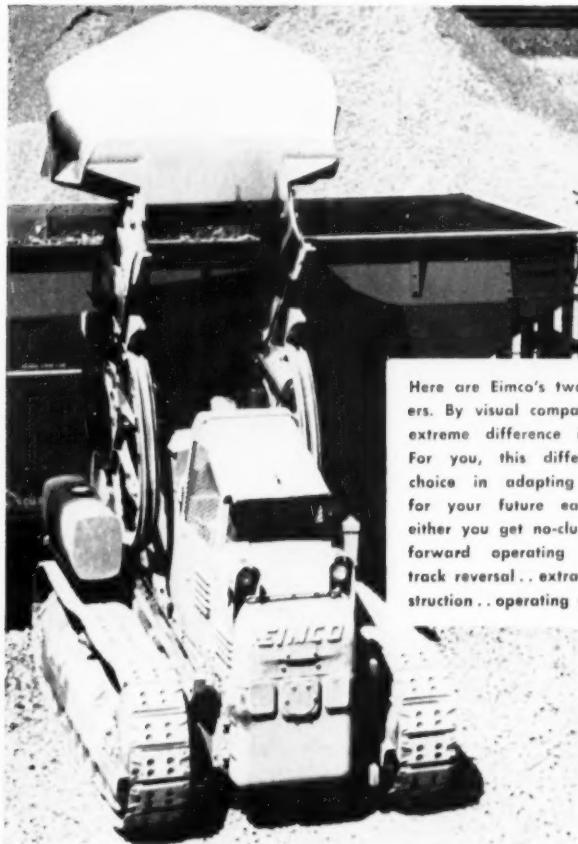
Each of the 13 weekly shows will consist of four 5-min documentary films each showing some part of the industry's work plus a brief discussion with government officials or other guests of current industry news.

More than 200 television stations with an estimated audience of 7,500,000 will carry the show. It will be sponsored by the Producers' Council, an organization composed of about 200 building material and equipment producers and associations.

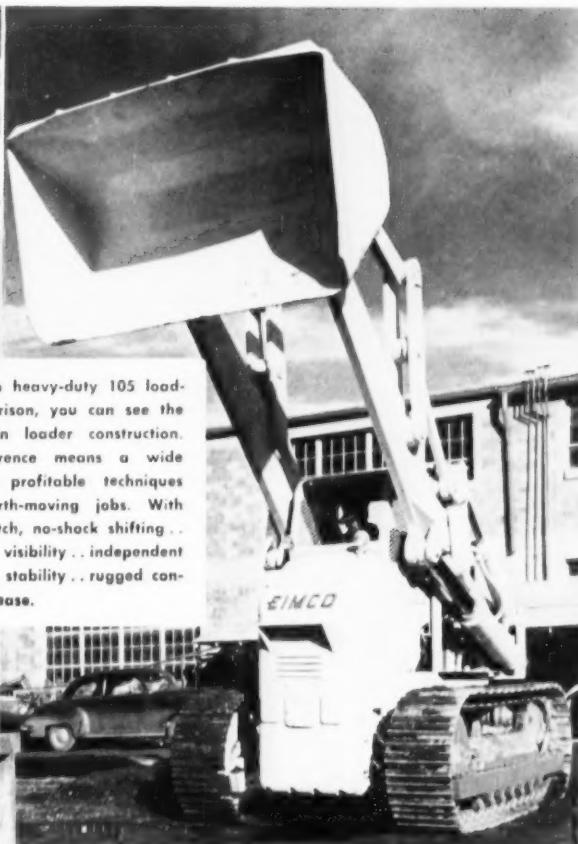
"This is the first time that any concerted industry-wide effort has been made to inform the public of the importance of the building industry to their living standards," said Fred M. Hauserman, president of the Producers' Council.

"Through public service we hope to make the people aware of how one gigantic \$50-billion industry is serving them."

ONLY EIMCO ... OFFERS YOU THIS LOADER SELECTION



EIMCO 105 EXCAVATOR



EIMCO 105 FRONT-END LOADER

THE 1½ YARD EIMCO EXCAVATING LOADER

can dig and load rock and other tough materials on a comparable basis with boom-type equipment many times more costly. The bucket travels overhead to discharge, providing an operating cycle of 10 to 12 seconds. With 39,000 lb. digging force and "high leverage" rocker arm contour, it digs fast . . even in tough clay, hardpan, shale, glacial till, etc.

The Eimco 105 Excavator is especially adapted to all types of tunnel excavating . . loading blasted rock or overburden on narrow benches . . removing material on highway projects without blocking the motorist by-pass lane . . and many other applications where ability to load without turning is convenient and saves time. Spot trucks close behind and your Eimco 105 operator will keep haulage equipment working at a maximum pace every hour.

Write for Bulletin L-1048 today!

THE 2½ YARD EIMCO FRONT-END LOADER with

40,000 lb. break-out is an extremely flexible heavy-duty loader — ideal for digging off high banks . . handling fine, dusty or wet material . . discharging into any size trucks spotted on a higher elevation . . cutting smooth grades where strong downward pressure is needed . . razing . . bulk loading . . and many other applications. Dozer blades, fork lifts and other attachments are readily fitted to this loader. It operates in 9' 6" headroom . . can reach over a 14' bin, hopper or gondola to discharge its cargo.

The loader mechanism operates at high mechanical efficiency and has many exclusive hydraulic system protective features. Combine this with extreme 105 tractor mobility and you get an earthmover that will make more trips every hour . . stay on the job longer . . get greater total production than competitive front-end units.

Write for Bulletin L-1050 today!

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B-282

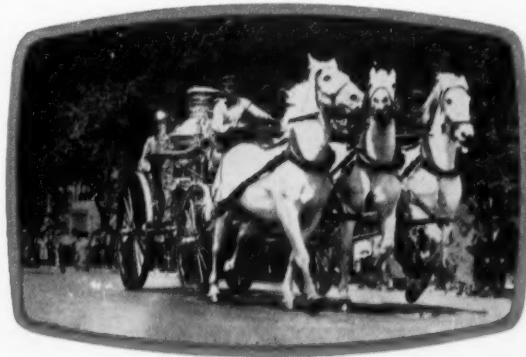
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Two big hour-long spectaculars this fall



Over 126 NBC STATIONS, SEPTEMBER 23rd

"Eleven Against the Ice", the story of the Antarctica Turnpike. See men and machines build a trail across Antarctica's frozen wastes—in spite of 200 mph winds, temperatures of 120 degrees below zero and crevasses big enough to swallow a 20-story building. It's a triumph of engineering and human courage, a whale of a television show.



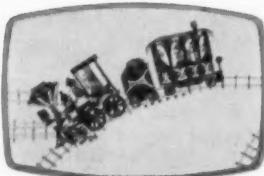
Over 142 NBC STATIONS, NOVEMBER 21st

"The Innocent Years". Recaptured from exciting old films and newsreels, you'll see happy days relived. Experience the excitement of "Teddy" Roosevelt, Thomas Edison and Mark Twain in action. Hear songs like: "In the Good Old Summertime", "He'd Have to Get Out and Get Under". Enjoy the fun of family picnics, the joys of people in the last untroubled time in our history.

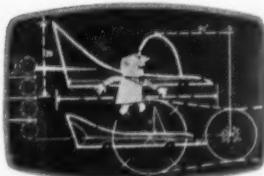
And commercials that help you sell . . .



See How man stumbled on the concept of the wheel.



See Why America's railroads have always led the world.



See Why Americans jump for the latest thing in cars.



See One man push a freight car all by himself.

Years of national and trade advertising, backed by their superior performance, have made "Timken" the best-known name in bearings—a name that helps to sell the products that use Timken® bearings. Now, network television

will build even a greater awareness of Timken bearings—make them an even bigger sales plus in the equipment you sell. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

TIMKEN TAPERED ROLLER BEARINGS

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